

University of Dundee

Developing an inventory to Assess Parental concerns and Enable child dental Registration (DAPER)

Chambers, Stephanie; Freeman, Ruth

Publication date:
2011

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):

Chambers, S., & Freeman, R. (2011). *Developing an inventory to Assess Parental concerns and Enable child dental Registration (DAPER): Year 2 Report: A validity and reliability study of the Parental Dental Concerns Scale*. University of Dundee, Dental Health Services Research Unit.

General rights

Copyright and moral rights for the publications made accessible in Discovery Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from Discovery Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Developing an inventory to Assess Parental concerns and Enable child dental Registration (DAPER)

Year 2 Report:

A validity and reliability study of the Parental Dental Concerns Scale

Stephanie Chambers & Ruth Freeman

Oral Health and Health Research Programme

Dental Health Services & Research Unit

University of Dundee

November 2011



Executive Summary	5
Introduction	6
Aim and Objectives	6
Method	6
Results	7
Summary	7
Next Steps	7
Introduction	9
The Childsmile Programme	10
The Core Childsmile Programme	10
Childsmile Nursery and School	11
Childsmile Practice	11
Existing challenges	11
Background	12
Aim	17
Study 1	19
Method	20
Research context	20
Ethical considerations	20
Sample and procedure	20
The questionnaire	21
Data analysis	22
Results	23
Descriptive analysis	23
Construct validity	24
Concurrent validity	30
Reliability analysis	30
PDCS Short Form	31
Differences in PDCS scores	33
Dental anxiety	39
Regression analyses	40

Study 2	45
Method.....	46
Research context.....	46
Sample and procedure.....	46
The questionnaire.....	46
Data analysis	47
Results.....	47
Descriptive analysis	47
Bivariate analysis	50
Construct validity	51
Predictive validity.....	51
Summary.....	55
Discussion	59
Next Steps.....	65
Introduction	66
Method.....	66
Design.....	66
Sample	67
Questionnaire assessment.....	67
Statistical analysis	67
References and Acknowledgements	69
References.....	70
Acknowledgements.....	75
Appendices	77
Appendix 1 – Ethical Approval Documents	78
Appendix 2 – NHS Project Approval Documents.....	83
Appendix 3 – Questionnaire.....	90
Appendix 4 – Descriptive Tables.....	101
Appendix 5 – Financial Information.....	112

Executive Summary

Introduction

Childsmile is the national oral health programme for children in Scotland. Childsmile Practice offers support to families of children at the greatest risk of dental caries. This support aims to help families with children aged 0-2 years to register with a local dental practice and access preventive care. Childsmile has contributed to significant improvements in Scottish children's oral health, nevertheless, disparities remain. Children living in Scotland's most deprived communities continue to suffer from higher levels of dental decay than children living in more affluent communities. Oral health inequalities are exacerbated by a high number of missed appointments (32% of Childsmile Practice appointments are not attended), particularly in areas of high deprivation.

Aim and Objectives

The aim of the DAPER project is to develop an inventory to assess parental concerns and enable child dental registration and attendance for preventive dental care. The main objective of the research was to assess the psychometric properties of a new questionnaire to measure parental concerns regarding registration and access for preventive dental care for their child.

Method

Two studies were conducted to assess the validity and reliability of a Parental Dental Concerns Scale. In Study 1, a convenience sample of 399 parents recruited from parent and child groups and baby clinics answered questions on everyday parental concerns in relation to attending the dental practice. The scale was re-administered eight weeks later (n=116). In Study 2, 170 parents in a single health board responded to a postal questionnaire asking the same questions as Study 1, as well as questions on their satisfaction with the Childsmile Practice Programme.

Results

Results indicate that the PDCS had good validity and reliability. The PDCS was internally consistent, reliable over an eight week period, and had good concurrent validity with the Modified Dental Anxiety Scale. The PDCS had strong construct validity, and was able to discriminate between families who engaged in preventive care and those who did not. Lower levels of concern were reported by parents who were working, married, educated to university level, and who owned their own home. Higher concerns were predicted for parents who were not working, who did not own their home, and who had a greater number of children. The PDCS and age significantly predicted dental anxiety: those with higher dental concerns and younger parents reported higher anxiety.

Summary

The Parental Dental Concerns Scale has good reliability and validity. A positive association was demonstrated between the PDCS and dental anxiety, and this relationship must be investigated further. A greater understanding of the complexity involved in parents' failure to attend and comply with preventative oral health programmes can improve participation, and improve Scottish children's oral health.

Next Steps

In the next phase of the DAPER study, a field trial of the Parental Dental Concerns Scale will be conducted to identify parents with dental concerns, and assess if additional assistance can enable these parents to access preventive dental care for their child.

Introduction

Children in Scotland have traditionally had poor oral health. The Scottish Executive set a target of 60% of 5 year olds to show no signs of obvious dental decay by 2010 (Scottish Executive, 2005). An additional target was set of 80% of 3-5 year olds to be registered with an NHS dentist by 2008 (*Ibid*). Both targets were exceeded recently. The 2010 National Dental Inspection Programme identified 64% of 5 year olds as having no signs of obvious dental decay (MacPherson *et al.*, 2010), a rise of over 6% in two years (Merrett, *et al.*, 2008). By June 2009, the target of 80% of Scottish children aged 3-5 registered with an NHS dentist was also exceeded (ISD Scotland, 2011).

The Childsmile Programme

Improvements in Scottish children's oral health can, in part, be attributed to the introduction of the Childsmile Programme (Merrett *et al.*, 2008). Childsmile is Scotland's national oral health programme for children. Childsmile aims to improve the oral and general health of all Scottish children, but is particularly committed to reducing inequalities. The Programme is both universal and targeted in its approach, offering preventive dental care and enabling child dental registration. Every child has access to Childsmile, but support is tailored to the needs of individual children and their families.

The implementation of Childsmile has evolved through three main work streams: 1) a core toothbrushing programme; 2) Childsmile Nursery and School; and 3) Childsmile Practice.

The Core Childsmile Programme

As part of the core toothbrushing programme, families are provided with free oral health packs until children are aged 5. Private and local authority nurseries are invited to take part in daily supervised toothbrushing, as well as Primary 1 and 2 classes from schools in the 20% most deprived communities.

Childsmile Nursery and School

Childsmile Nursery offers children residing in the 20% most deprived communities six monthly fluoride varnish application in nursery. Similarly, Childsmile School offers six monthly fluoride varnish application to children residing in the 20% most deprived communities in the school setting from Primary 1 onwards.

Childsmile Practice

Childsmile Practice is directed at children 0-2 years, and helps to link families to Primary Care Dental Services by age six months. All children are invited to take part in the Practice Programme. Families are risk assessed via their health visitor to determine whether the child is at risk of developing tooth decay. Children identified as at risk are referred to a Dental Health Support Worker (DHSW).

The role of the DHSW is to provide families with oral health information and advice in their homes, to help families to register with a local dentist, and to arrange visits to the dental practice. At these visits, parents meet trained dental nurses, and are given advice on toothbrushing techniques, and information on diet and health. When the child is around 18 months they meet with a practice dentist. Older children are provided with fluoride varnish application and fissure sealants when attending the dental practice.

Existing challenges

Although progress has been made in improving the oral health of Scottish children, areas of concern remain. This is particularly true of children living in Scotland's most deprived communities. Whilst only 21% of children in the least deprived communities show signs of obvious dental decay by age five, 54% of children in the most deprived communities are affected by the same age (MacPherson *et al.*, 2010). In addition, only 41% of 0-2 year olds are currently registered with an NHS dentist, far short of the 55% target set by the Scottish Executive (ISD, 2011; Scottish Executive, 2005).

These issues highlight that Childsmile Practice has a critical task ahead, particularly in ensuring younger children are registered, and that families in deprived communities are engaged in preventive dental care. This is particularly difficult given that 32% of Childsmile Practice appointments between 2006-2008 were missed, and that non-compliance was highest in areas of greatest deprivation (Deas *et al.*, 2010).

It is in this context that the Oral Health and Health Research Programme as part of the Dental Health Services & Research Unit, at the University of Dundee was commissioned to undertake the DAPER project (Developing an inventory to Assess Parental concerns and Enable child dental Registration). The project is focused on understanding the barriers to dental attendance in order that families may be identified and supported to access dental health care. The project consists of three phases: a qualitative exploration of parental concerns; the design and validation of a quantitative measure of parental concerns; and a field trial of the measure to identify families requiring additional support. This report will focus on the results from the second phase of the DAPER project.

Background

With the roll out of the Childsmile Practice Programme across Scotland, a greater understanding was sought of the facilitators and barriers to families attending preventive dental appointments. A grounded theory approach was used to interview mothers living in deprived, rural and remote areas throughout Scotland about everyday concerns which might impact on their ability to take their child to a dental appointment. A main concern of ‘mothering when it’s not for me’ was identified from the interviews. Mothers’ everyday experiences were far removed from idealised images of motherhood, and they struggled with many difficulties. Mothers attempted to resolve their main concern by ‘getting on with it’. ‘Getting on with it’ was the core category identified from the interviews, and explained the greatest variance in the data.

Mothers articulated a feeling that motherhood, as they experienced it, was 'not for me'; however, mothers had little choice other than to 'get on with it.' They engaged in 'getting on with it' rather than an idealised version of mothering. 'Getting on with it' was already experienced by some mothers before their children were born through a difficult pregnancy, or a complicated delivery. These mothers experienced feelings of disappointment, as did those who had wanted to breastfeed but were unable to. Ironically, it was those mothers who shunned official advice on breastfeeding who seemed best able to 'get on with it'. They were able to be separated from their baby, allowing them to have greater freedom. Mothers who encountered difficulties such as these found that they were not always supported fully by health care professionals during this time: they were left to 'get on with it'. This may explain why they reject the Childsmile Programme, their experience has led them to believe that they will cope better on their own.

'Getting on with it' was evident in relation to mothers' everyday interactions with their children, which could be described as chaotic. Often routines were not established, and mothers struggled to get children to sleep, to eat healthily, and to brush their teeth. In addition, mothers spoke of having to 'battle' their children's behaviour, and of their embarrassment when children acted out in public. Mothers, therefore, found it difficult to follow the advice offered by Childsmile concerning food and drinks, and toothbrushing. They were also unable to control their children in public, and feared the reactions of others to their children's disruptive behaviour when attending the dental practice.

Mothers spoke of 'getting on with it' when dealing with the changes that a new baby brought. The mothers struggled in relation to low self-esteem and finding time. They had to devote almost all their attention to a new baby, which left little time for themselves. They could no longer spend time on their personal appearance, with their partner, or on relaxation. Many mothers felt that when they did have some time, they should be 'getting on' with housework. This might help to explain why some mothers fail to attend appointments. Looking after their child, and running a home, already consumes much of their time; Childsmile Practice may be an additional 'burden' that would negatively affect mothers' ability to 'get on with it'.

The seemingly simple act of 'getting out the door' with children was often impossible for mothers, and they became both socially and physically isolated. In an attempt to 'get on with it', mothers withdrew. Mothers without transport had a particularly difficult time taking small children and babies on buses: this made attending appointments at the dental practice more complicated. Many of the mothers taking part in the study had the additional strain of unstable living conditions. The arrival of a new baby often meant moving into new social housing, further from the health centre or dental practice where they had attended previously.

Withdrawal could also be experienced through social isolation when mothers did not have close family, friends or a partner to share childrearing with. Mothers not only lacked practical support, but also emotional support. When there was no one else to help look after children, the whole family would have to be taken along to appointments. Mothers also reported isolation from wider society in terms of the negativity they had experienced from others in relation to their children. This appeared to be most frequently encountered on public transport: another reason to avoid making unnecessary journeys. Finally, mothers could feel isolated from health services. They reported feeling alienated from health professionals, unhappy with a lack of continuity, dental anxiety, and expressed a wish for more family-orientated services.

These concerns highlight that mothers are engaged in a process of 'getting on with it'. They are unable to be an 'ideal' mother, and when they face adverse circumstances, they do not have the internal or the external resources to change these circumstances. Mothers try to 'get on with it' as best they can; however, some are still left feeling depressed, isolated and with low self-esteem. These feelings can be exacerbated as mothers try to function in society with their children. Getting out the door can be stressful, expensive, and, at times, threatening. In these circumstances, mothers retreat and find that one way to resolve these issues is by staying at home.

The information gained from these interviews was used to construct a Parental Dental Concerns Scale (PDCS).

Aim

The aim of the DAPER study is to develop an inventory to assess parental concerns and enable child dental registration and attendance for preventive dental care. The project has three main objectives, which are to:

1. Conduct a qualitative exploration to identify the main concerns of parents.
2. Assess the psychometric properties of a new questionnaire to assess parental concerns regarding registration and access for preventive dental care for their child.
3. Conduct a field trial of the Parental Dental Concerns Scale (PDCS) to identify parents with dental concerns, and assess if additional assistance can enable these parents to access preventive dental care for their child.

This report will focus on the work undertaken in investigating the second objective. The second phase of the project was conducted between May 2010 and July 2011. The results from this work will assess the reliability and validity of the Parental Dental Concerns Scale. Two studies were carried out to assess the validity and reliability of the Parental Dental Concerns Scale. Study 1 investigated the construct and concurrent validity of the PDCS, and its reliability. Study 2 confirmed the construct validity of the PDCS, and its predictive validity.

Study 1

Method

Research context

Childsmile Practice has been running in the west of Scotland (Greater Glasgow & Clyde and Ayrshire & Arran health boards) since 2006. The Programme was rolled out in NHS Lanarkshire in 2007, and partially in NHS Highland in 2008 (Inverness and Caithness). It had not rolled out in Tayside (Dundee) and Fife at the time of the studies.

Ethical considerations

Ethical approval for both Study 1 and 2 was obtained from the Fife and Forth Valley Research Ethics Committee (REC ref: 10/S0501/11) (See Appendix I).

Information sheets outlining the studies' purpose, and what was required of each participant, together with written consent forms, were provided. Information sheets and consent forms were written in non-technical language, with readability assessed using the Flesch Reading Ease score and Flesch-Kincaid Grade Level score. Informed consent was sought from all participants. All ethical documents can be found in Appendix I.

Sample and procedure

A convenience sample was recruited from parents living in areas not yet taking part in Childsmile Practice. This included parents living in Tayside, Fife, Highland and Forth Valley. Parents were recruited from local organisations working with families, and baby clinics. Study inclusion criteria included parents, or primary carers, of pre-school children, with no known learning disability, who were able to read or understand English. There was an attempt to recruit participants from deprived communities, as the majority of families referred to the Childsmile Practice programme reside in areas of this type. A researcher introduced the study to parents, provided information sheets, and gained informed consent. Assistance was provided when necessary as parents self-completed the questionnaire.

Each parent was asked whether they were willing to complete a second administration of the questionnaire eight weeks later. The second administration determined the test-retest reliability of the PDCS over a moderate time period. At eight weeks, parents were contacted, and asked if they still wished to take part. If so, questionnaires were posted to parents' home address. Parents had the option of returning the questionnaire using a Freepost envelope, or completing the questionnaire with SC by telephone.

The questionnaire

Information gained from the qualitative exploration of parental concerns was used to generate items for the PDCS. The questionnaire was split into three sections. The first section asked participants about 'Going to the dentist', and included six semantic differential questions measuring attitudes towards attending a dental visit with a young child on a seven point scale (1-7). Parents were then asked how strongly they agreed or disagreed with five statements about dental appointments (from +1 strongly disagree to +5 strongly agree). A measure was taken of parents' dental anxiety using the Modified Dental Anxiety Scale (MDAS) (Humphris, et al., 1995; Humphris, et al., 2000). Finally, measures were taken of time elapsed since parents' last dental visit, and how regularly they attended the dentist.

The second section asked parents about 'Family Life', and included items on social support, breastfeeding, feeling down, children's behaviour, satisfaction with health care, and bonding.

The final section requested demographic information, including the number of children currently living with the parent, children's ages, participant's own age, working status, living status, education level, and housing status.

Parents were asked to think of their youngest child when answering the majority of questions. The youngest child was chosen to focus parents' responses as Childsmile Practice is aimed at children aged 0-2. Full question wording can be found in Appendix 3.

Oral health promoters and parents with young children were consulted to determine the face validity of the questionnaire. Small changes were made to question wording and formatting based on this feedback. The questionnaire was then piloted on six parents attending a local parents' support group. Parents had difficulty in understanding instructions for the first question, therefore, formatting was changed to make instructions to participants more explicit.

Data analysis

SPSS Statistics version 19.0 was used for descriptive, exploratory and bivariate data analysis. Confirmatory Factor Analysis (CFA) was carried out using SPSS AMOS version 19.0. Relevant items were reverse scored to ensure that high scores represented greater parental concerns.

Construct validity

Exploratory Principal Components Analysis (PCA) was used to explore the construct validity of a Parental Dental Concerns Scale (PDCS), and to aid data reduction. The number of components to be retained in the PCA was determined using parallel analysis. Parallel analysis compares the sample component structure with that of a random population component structure. Components with eigenvalues greater than that obtained from random numbers are retained. This helps to reduce the ambiguity often associated with determining the number of retained components from eigenvalues >1 or scree plots (Hayton et al., 2004). Cronbach's alpha scores determined whether scales were internally consistent. CFA allowed the adequacy of the measurement model to be tested (Bollen & Long, 1993). The variance of the first indicator of each latent variable was set to 1.0 for first order latent variables. The variance of the second order latent variable was also set to 1.0, as well as error terms attached to indicators. This reduced the number of model parameters to be estimated, and ensured model identification (Kline, 1998). Bootstrapping was applied to determine the significance of path coefficients, with 2000 bootstrapping

samples selected to ensure the stability of probability estimates. A number of conventional fit indices were employed to determine model adequacy including: Comparative Fit Index (CFI) of >0.90 , Root Mean Square Error of Approximation (RMSEA) of >0.06 (Bentler and Hu, 1995), and chi-square/degrees of freedom ratio of <2 . The invariance of the measurement model was tested across housing type (bought home/other housing), with the equivalence of a constrained versus unconstrained model assessed via the significance of the change in chi-square statistic between the two models.

Concurrent validity

Concurrent validity was established using bivariate Pearson correlation analysis of the new measure with the established Modified Dental Anxiety Scale (Humphris, et al., 1995; Humphris, et al., 2000).

Reliability

Cronbach's alpha coefficients were calculated to assess the internal consistency of each measure. Test-retest reliability was assessed by paired t-tests and intra-class correlation coefficients (Streiner & Norman, 2008).

Results

Descriptive analysis

In Study 1, 434 parents were invited to participate, with 92% agreeing to take part ($n=399$). At the second administration, 116 parents participated, from a possible 259 who had originally agreed to be retested (45%). The majority of parents were mothers ($n=378$), with the remainder fathers or care givers. All participants will be described as parents throughout the report. Demographic information is presented in Table 1.

Parents' mean age was 30 years ($SD = 6.96$), and the mean number of children living with parents was 1.8 ($SD = 0.96$). The percentage of participants selecting each response category for each question can be found in Appendix 4. Of note is that 75% of parents reported that they attended the dentist at least every six months for themselves, and 14% of parents reported that they attend only when they have a problem, or not at all.

Sixty per cent of parents scored at least 10 or above on the Modified Dental Anxiety Scale, suggesting that they were moderately or highly dentally anxious. Twenty per cent of parents were highly dentally anxious (scoring 19 or above on MDAS) (Humphris *et al.*, 1995). The greatest levels of anxiety were recorded for questions on having a tooth drilled and receiving a local anaesthetic injection. Forty one per cent of parents were very or extremely anxious about having a tooth drilled, with 40% similarly anxious in relation to a local anaesthetic injection. Similar reports of anxiety were exhibited for 20% of parents in relation to sitting in the waiting room, 19% receiving treatment tomorrow, and 17% in relation to receiving a scale and polish.

Construct validity

Thirty two items were included in the PCA. Analysis was run on responses from 319 parents who had fully completed items relating to ease of going to the dentist and family life. The first PCA was unrotated. Ten components had eigenvalues greater than one; however, the results of a parallel analysis indicated that only six components should be retained. A second PCA was run specifying six components, with direct oblimin rotation to improve interpretability of components.

Table I – Demographic variables – Study I (n=399)

No. children at home	n	%	Living status	n	%
0	1	0.3	Married	173	4.4
1	180	45.1	Living with partner	110	27.6
2	137	34.3	In a relationship	40	10.0
3+	72	18.1	Single	63	15.8
Missing	9	2.3	Divorced	7	1.8
			Widowed	1	0.3
			Missing	5	1.3
Working status	n	%	Education level	n	%
Full time parent	219	54.9	School	117	29.3
Working/Studying pt	123	30.9	College	148	37.1
Working/Studying ft	45	11.3	University	122	30.6
Missing	12	3.0	Missing	12	3.0
Housing type	n	%			
Bought home	197	49.4			
Renting privately	54	13.5			
Social housing	122	30.6			
Family/Friends/Temp	21	5.3			
Missing	5	1.3			

The KMO measure of sampling adequacy was high (0.79), and Barlett's test of sphericity significant ($\chi^2 = 2790$, $df = 496$, $P < 0.001$). The six components explained 46% of the variance in the correlation matrix (Table 2). Component loadings of >0.3 were considered high (Stevens, 2002), and were used to determine onto which component each item loaded. All but two items ('I have little time to spend on myself' and 'All my time is spent on being a parent') loaded onto a single component. Where items cross loaded, items were assigned to the component onto which they loaded most highly.

The six components were unambiguous to interpret, and suitable labels were given to the following subscales: Parental Exclusion, Bottlefeeding, Negative Healthcare Experiences, Going to the Dentist, Housing Dissatisfaction, and Lack of Parental Control. Items within each component were summed to construct subscales. Means and Cronbach α scores for each subscale are shown in Table 2. Only four subscales had acceptable internal consistency, therefore, Negative Healthcare Experiences and Lack of Parental Control were excluded from subsequent analysis. All 21 items belonging to the four internally consistent subscales were combined to provide a single Parental Dental Concerns Scale, which demonstrated excellent internal consistency ($\alpha = 0.83$). The mean score of the PDCS was 50.9 (SD = 11.1, possible range = 21-105).

A four factor model was fitted with the PDCS subscales, with an overarching second order Parental Dental Concerns latent construct (see figure 1). Table 3 shows that the four factor model with uncorrelated errors was a reasonable fit, with fit indices within the range specified for adequacy. The model was improved, however, with the inclusion of two correlated pairs of errors terms, identified from high Ledge indices. Neither were theoretically meaningful, and were retained in further analyses. Subscales were labelled as before. Standardised regression coefficients were significant at the $P=0.01$ level or less.

Table 2 – Principal Components Analysis* (with oblimin rotation) (n=319)

	PE 1	BF 2	NEHC 3	GD 4	HD 5	LPC 6
Mean (SD)	26.3 (6.9)	7.5 (3.1)	8.8 (2.7)	10.8 (3.3)	6.3 (2.8)	6.6 (2.2)
Cronbach's α	0.83	0.71	0.39	0.65	0.72	0.43
Some days I feel miserable	0.780					
I feel down most days	0.671					
Since my child was born, I have not felt like my usual self	0.615					
I get stressed if my child cries when we are out	0.611					
Some days I don't want to do anything	0.607					
I have little time to spend on myself	0.588		-0.336			
All my time is spent on being a parent	0.531		-0.523			
When I look in the mirror, I feel good about the person I see	0.501					
Getting out the house with my child is difficult	0.379					
People can be unfriendly when I am out with my child	0.341					
Breastfeeding is not for me		0.810				
Breastfeeding is better than bottlefeeding		0.744				
Breastfeeding is difficult		0.725				
I felt unprepared when I left hospital with my baby			0.534			
I was happy with the care I received during my last pregnancy			0.482			
My health visitor knows me well			0.449			
I was disappointed with the delivery of my last child			0.341			
My family help me by babysitting			-0.301			
My child is happy for me to care for their teeth and gums						
Travelling to the dentist is easy				-0.800		
Travelling to the dentist is expensive				-0.793		
Dentists are family friendly				-0.592		
Other people in my situation find it easier to take their children to the dentist				-0.536		
I feel frightened about going to the dentist with my child				-0.360		
My partner helps me look after our child						
I feel settled in my home					-0.929	
I am happy where I am currently living					-0.926	
My neighbours can be difficult					-0.542	
My child eats the foods I want them to eat						0.728
My child drinks what I want them to drink						0.673
My child sleeps well at night						0.339
I have someone close to me I can speak to about my problems						
PE - Parental Exclusion				GD - Going to the Dentist		
BF - Bottlefeeding				HD - Dissatisfaction with Housing		
NEHC - Negative Experiences of Healthcare				LPC - Lack of Parental Control		

* Factor loadings above 0.3 displayed only

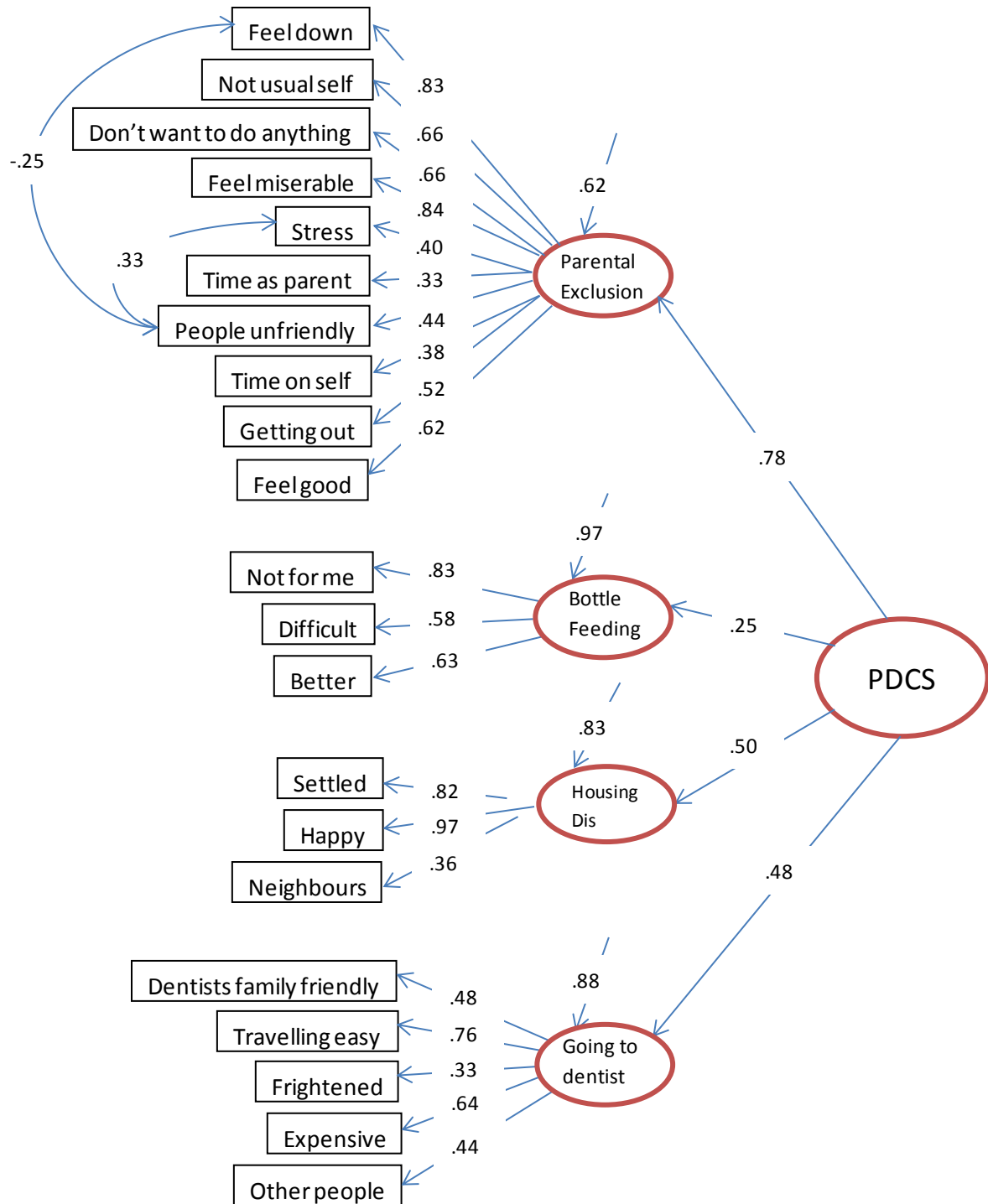
Table 3 – Fit indices for second-order CFA model of Parental Dental Concerns Scale (n=319)

Model	χ^2	df	χ^2/df	CFI	RMSEA	RMSEA 90% LCI	RMSEA 90% UCI
Four factor							
Uncorrelated errors	360.18	185	1.95	0.907	0.055	0.046	0.063
Two correlated errors	309.28	183	1.69	0.933	0.047	0.037	0.055

RMSEA, root mean square error of approximation; CFI, comparative fit index

To determine the invariance of the measurement model across housing type, two additional models were compared, split by parents living in a bought home and parents living in other housing. In the first model, indicators were unconstrained. In the second, a constrained model was tested, with parameters fixed between the first order latent subscales and observed variables, and between correlated errors, across housing type. The key relationships between the constructs were close to identical across groups, with a non-significant change in chi-square statistic ($\Delta\chi^2=29.57$, $df=19$, $P>0.05$).

Figure 1 – Path diagram of standardised solution of second order CFA (n=319)



Concurrent validity

To assess the concurrent validity of the PDCS and its subscales, correlation analysis was carried out using these measures and the Modified Dental Anxiety Scale. Additional measures of Attitude towards taking their child to the dentist and Bonding were also included within the analysis. Pearson correlations are presented in Table 4.

Table 4 – Pearson correlations (n=319)

	MDAS	Bond	ATT	PE	BF	GD	HD	PDCS
MDAS	1							
Bonding	-0.076	1						
Attitude	-0.234**	0.157**	1					
Parental Exclusion	0.314**	-0.349**	-0.152**	1				
Bottlefeeding	0.143*	-0.039	-0.146*	0.176**	1			
Going to Dentist	0.300**	-0.157**	-0.502**	0.325**	0.192**	1		
Housing Dissatisfaction	0.175**	-0.195**	-0.086	0.390**	0.123*	0.208**	1	
PDCS	0.368**	-0.324**	-0.305**	0.866**	0.474**	0.474**	0.593**	1

* Significant at the 5% level

** Significant at the 1% level

The results show that dental anxiety is significantly correlated with the PDCS and its subscales. The highest correlations are for the PDCS and Parental Exclusion. Moderate and significant correlations were also identified in relation to Bonding and the PDCS, and in particular, the Parental Exclusion subscale. A highly significant and moderate-to-high correlation existed between Attitude towards taking child to the dentist and the Going to the Dentist subscale of the PCDQ. These results indicate that the concurrent and construct validity of the PDCS is good, in particular, in relation to an established measure such as the MDAS.

Reliability analysis

The reliability of the PDCS, and each subscale, was assessed by comparing parents' test and retest scores. Paired t-tests indicated that there were no significant differences between

the scales at time 1 and time 2. Pearson correlations were high and highly significant, as were intra-class correlations, which indicated that not only were participants' responses consistent, but that there was also strong absolute agreement between time 1 and time 2 (see Table 5).

Table 5 – Reliability analysis - Time 1 and Time 2 (n=85)

	Paired t-test		Pearson's correlation		Intra-class correlation	
	<i>t</i>	<i>P</i>	<i>r</i>	<i>P</i>	<i>ICC</i>	<i>P</i>
PDCS	-1.013	0.314	0.773	0.000	0.773	0.000
Parental Exclusion	-0.457	0.649	0.767	0.000	0.768	0.000
Bottlefeeding	-0.537	0.593	0.862	0.000	0.863	0.000
Going to the Dentist	-1.329	0.188	0.686	0.000	0.681	0.000
Housing Dissatisfaction	-0.537	0.593	0.652	0.000	0.648	0.000

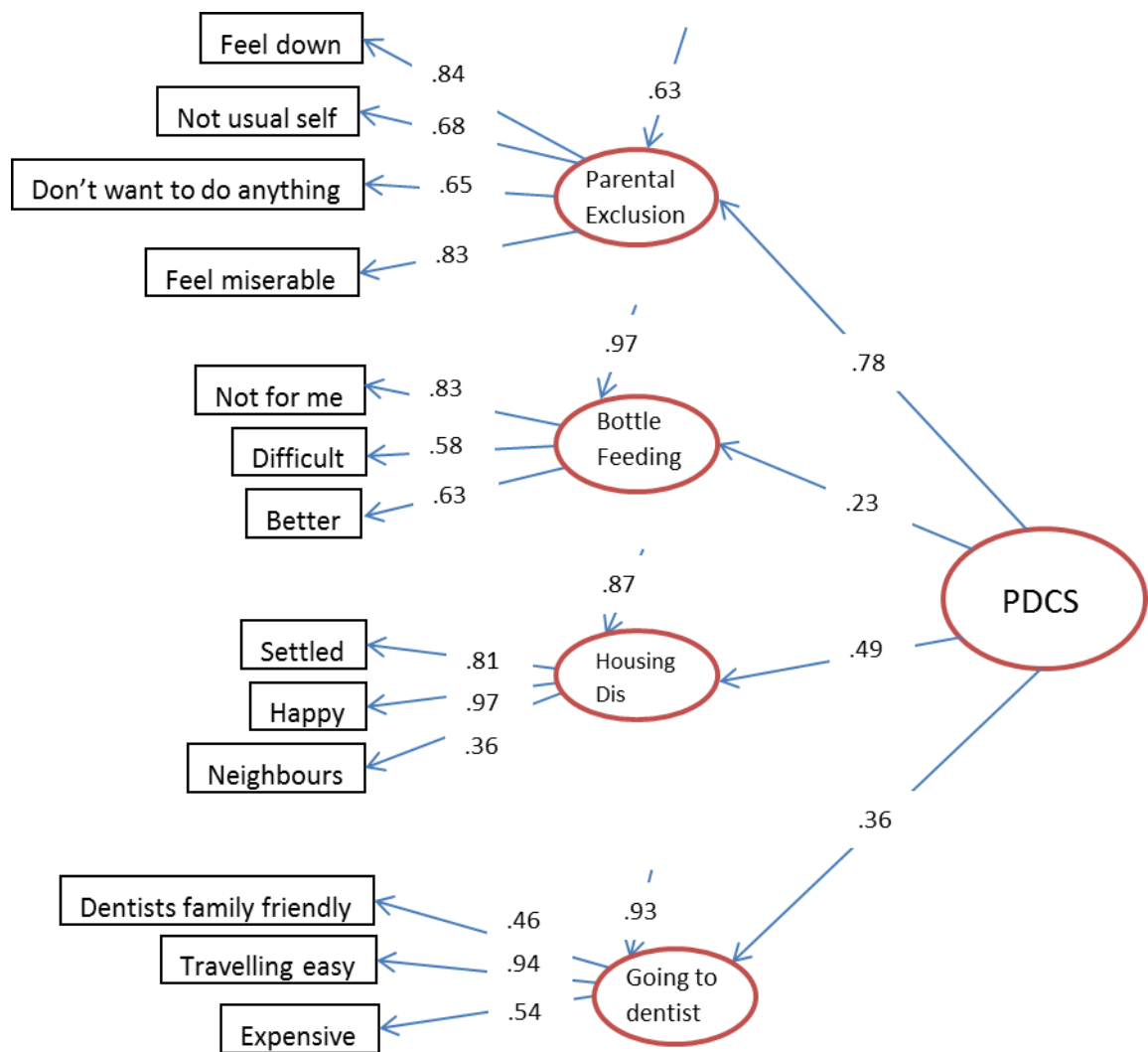
PDCS Short Form

Although the 21 item Parental Dental Concerns Scale demonstrated good validity and reliability, there was concern that the scale could be too long in its current form for use within the community setting. With this in mind, the adequacy of the measurement model for the short form of the scale was also tested. Items for the longer subscales of Parental Exclusion and Going to the Dentist were selected based on high factor loadings.

Bottlefeeding and Housing Dissatisfaction remained unchanged to retain at least three items per subscale. For Parental Exclusion, four items were retained based on high loadings (0.83, 0.66, 0.84, 0.66). Three items were retained for Going to the Dentist (0.48, 0.76, 0.64).

Results indicated that the model performed very well, $\chi^2 = 98.76$, df 61, $P=0.002$, with a CMIN/DF ratio of 1.62, CFI=0.97, and RMSEA=0.04 (RMSEA 90% LCI=0.03, 90% UCI=0.06).

Figure 2 – Path diagram of standardised solution of second order CFA (n=319)



Differences in PDCS scores

One way analysis of variance was carried out to determine whether differences existed in scores for the PDCS and its subscales amongst different groups of participants. ANOVAs determined whether there were significant differences in scores by participants' working status, living status, education level, and housing type.

The results in Table 6 indicate that there were highly significant differences for groups of parents in relation to the PDCS and its subscales. There were no significant differences for parents of different working statuses in relation to Bottlefeeding, or parents of different education levels in relation to Going to the Dentist. To investigate differences between groups of participants further, post hoc tests were carried on specific comparisons of interest. Significance levels were adjusted to account for multiple comparisons.

Participants who were full time parents had higher mean scores for the PDCS and its subscales than parents who were working part time, suggesting that these parents had greater concerns. Full time parents were also more likely to score highly in relation to Parental Exclusion than parents who were working full time (Table 7).

Table 6 – One way Analysis of Variance by demographic group

	n	F	df	P
PDCS				
Working status	312	28.8	2	0.000
Living status	317	21	2	0.000
Education	314	15.7	2	0.000
Housing type	318	26.8	3	0.000
Parental Exclusion				
Working status	312	17.2	2	0.000
Living status	317	10.5	2	0.000
Education	314	8.6	2	0.000
Housing type	318	19.0	3	0.000
Bottlefeeding				
Working status	312	1.1	2	0.336
Living status	317	6.3	2	0.002
Education	314	20.6	2	0.000
Housing type	318	7.1	3	0.000
Going to the Dentist				
Working status	312	3.2	2	0.041
Living status	317	7.9	2	0.000
Education	314	2.2	2	0.108
Housing type	318	6.2	3	0.000
Housing Dissatisfaction				
Working status	312	5.3	2	0.006
Living status	317	12.8	2	0.000
Education	314	5.4	2	0.005
Housing type	318	11.5	3	0.000

Table 7 – Posthoc comparisons of working status – Games-Howell (n=312)

	Mean Full time parent n=177	Mean Working PT n=105	<i>P</i> *
PDCS	53.8 (11.8)	46.6 (8.6)	0.000
Parental Exclusion	28.3 (7.4)	23.7 (5.2)	0.000
Bottlefeeding	7.7 (3.0)	7.2 (3.1)	0.414
Going to the Dentist	11.1 (3.4)	10.1 (2.9)	0.024
Housing Dissatisfaction	6.7 (3.1)	5.6 (2.4)	0.004

	Mean Full time parent n=177	Mean Working FT n=30	<i>P</i> *
PDCS	53.8 (11.8)	49.1 (9.7)	0.061
Parental Exclusion	28.3 (7.4)	24.5 (5.7)	0.006
Bottlefeeding	7.7 (3.0)	8.0 (3.2)	0.901
Going to the Dentist	11.1 (3.4)	10.9 (3.4)	0.943
Housing Dissatisfaction	6.7 (3.1)	5.8 (2.2)	0.141

*Adjusted significance level - 0.025
PT - Part Time FT - Full Time

In relation to living status, there were no significant differences between parents living with a partner, and single parents. There were significant differences, however, for married parents and those living with a partner, and single parents. Married parents reported lower mean scores on the PDCS and each subscale than single parents, and lower scores in relation to the PDCS, Parental Exclusion, and Housing Dissatisfaction than parents living with a partner (Table 8).

Table 8 – Posthoc comparisons of living status – Games-Howell (n=317)

	Mean Married n=142	Mean Living with partner n=88	<i>P</i> *
PDCS	46.9 (9.8)	52.5 (10.7)	0.007
Parental Exclusion	24.5 (6.4)	27.1 (6.1)	0.000
Bottlefeeding	6.9 (3.1)	7.9 (3.3)	0.059
Going to the Dentist	10.0 (2.7)	10.9 (3.7)	0.123
Housing Dissatisfaction	5.5 (2.4)	6.7 (2.8)	0.003

	Mean Married n=142	Mean Single n=87	<i>P</i> *
PDCS	46.9 (9.8)	55.7 (11.0)	0.000
Parental Exclusion	24.5 (6.4)	28.5 (7.6)	0.000
Bottlefeeding	6.9 (3.1)	8.2 (2.5)	0.001
Going to the Dentist	10.0 (2.7)	11.7 (3.4)	0.000
Housing Dissatisfaction	5.5 (2.4)	7.3 (3.1)	0.000

	Mean Living with partner n=88	Mean Single n=87	<i>P</i> *
PDCS	52.5 (10.7)	55.7 (11.0)	0.129
Parental Exclusion	27.1 (6.1)	28.5 (7.6)	0.356
Bottlefeeding	7.9 (3.3)	8.2 (2.5)	0.700
Going to the Dentist	10.9 (3.7)	11.7 (3.4)	0.285
Housing Dissatisfaction	6.7 (2.8)	7.3 (3.1)	0.380

*Adjusted significance level - 0.017

Table 9 shows that there were no significant differences between parents educated to school level and parents educated to college level in relation to the PDCS and its subscales. There were significant differences, however, between parents educated to university level and both other groups. Parents educated to university level had lower scores in relation to the PDCS, Parental Exclusion, and Bottlefeeding compared with those educated to school level, and lower scores compared with those educated to college level for the PDCS and each subscale except Going to the Dentist.

Table 9 – Posthoc comparisons of education level – Games-Howell (n=314)

	Mean (SD) School n=90	Mean (SD) College n=122	<i>p</i> *
PDCS	53.4 (11.2)	52.9 (10.6)	0.957
Parental Exclusion	27.5 (7.0)	27.4 (7.1)	0.994
Bottlefeeding	8.3 (2.7)	8.1 (2.8)	0.830
Going to the Dentist	11.3 (3.6)	10.6 (3.3)	0.346
Housing Dissatisfaction	6.3 (3.1)	6.8 (2.9)	0.369

	Mean (SD) School n=90	Mean (SD) University n=102	<i>p</i> *
PDCS	53.4 (11.2)	46.0 (10.0)	0.000
Parental Exclusion	27.5 (7.0)	24.1 (6.1)	0.001
Bottlefeeding	8.3 (2.7)	6.0 (3.1)	0.000
Going to the Dentist	11.3 (3.6)	10.3 (2.8)	0.102
Housing Dissatisfaction	6.3 (3.1)	5.6 (2.3)	0.234

	Mean (SD) College n=122	Mean (SD) University n=102	<i>p</i> *
PDCS	52.9 (10.6)	46.0 (10.0)	0.000
Parental Exclusion	27.4 (7.1)	24.1 (6.1)	0.001
Bottlefeeding	8.1 (2.8)	6.0 (3.1)	0.000
Going to the Dentist	10.6 (3.3)	10.3 (2.8)	0.742
Housing Dissatisfaction	6.8 (2.9)	5.6 (2.3)	0.001

*Adjusted significance level - 0.017

Significant differences were identified for parents living in a bought home compared to those renting privately. Parents renting privately demonstrated higher PDCS and Parental Exclusion scores. Parents living in a bought home had lower mean scores for the PDCS and each subscale compared with parents living in social or temporary housing. There were no significant differences between parents renting privately and those living in social or temporary housing (Table 10).

Table 10 – Posthoc comparisons of housing status – Games-Howell (n=318)

	Mean (SD) Bought home n=165	Mean (SD) Renting Privately n=46	<i>P</i> *
PDCS	46.2 (8.9)	54.3 (10.7)	0.000
Parental Exclusion	23.8 (5.8)	28.9 (6.9)	0.000
Bottlefeeding	6.8 (3.1)	8.0 (3.3)	0.076
Going to the Dentist	10.0 (2.8)	11.1 (3.7)	0.181
Housing Dissatisfaction	5.5 (2.4)	6.3 (2.5)	0.136

	Mean (SD) Bought home n=165	Mean (SD) Social/Temp Housing n=107	<i>P</i> *
PDCS	46.2 (8.9)	56.7 (11.0)	0.000
Parental Exclusion	23.8 (5.8)	29.1 (6.9)	0.000
Bottlefeeding	6.8 (3.1)	8.4 (2.6)	0.000
Going to the Dentist	10.0 (2.8)	11.7 (3.5)	0.000
Housing Dissatisfaction	5.5 (2.4)	7.4 (3.2)	0.000

	Mean (SD) Renting Privately n=165	Mean (SD) Social/Temp Housing n=107	<i>P</i> *
PDCS	54.3 (10.7)	56.7 (11.0)	0.426
Parental Exclusion	28.9 (6.9)	29.1 (6.9)	0.979
Bottlefeeding	8.0 (3.3)	8.4 (2.6)	0.762
Going to the Dentist	11.1 (3.7)	11.7 (3.5)	0.604
Housing Dissatisfaction	6.3 (2.5)	7.4 (3.2)	0.050

*Adjusted significance level - 0.017

Dental anxiety

One way analysis of variance was used to investigate demographic group differences in dental anxiety levels. Results show that there were significant differences among parents with different living status ($F(2,313)=8.52$, $P<0.001$) and housing status ($F(2,314)=23.4$, $P<0.001$). One way ANOVA indicated that there were significant differences in terms of working status ($F(2,308)=3.06$, $P=0.048$) and education levels ($F(2,310)=3.17$, $P=0.043$), however, post hoc tests revealed that differences between groups were not significant when significance levels were adjusted to account for multiple comparisons. The results in Table 11 show that parents who were married were less likely to report dental anxiety than parents who were single. Parents who were single had the highest mean dental anxiety score. Parents who were living in a bought home were also less likely to report high dental anxiety than those renting privately or living in social or temporary housing (Table 12).

Table 11 –Posthoc comparisons of MDAS scores by living status – Games-Howell (n=317)

	Mean Married n=142	Mean Living with partner n=88	<i>P</i>*
MDAS	11.4 (5.5)	13.2 (5.7)	0.043
	Mean Married n=142	Mean Single n=87	<i>P</i>*
MDAS	11.4 (5.5)	14.5 (6.0)	0.000
	Mean Living with partner n=88	Mean Single n=87	<i>P</i>*
MDAS	13.2 (5.7)	14.5 (6.0)	0.315

*Adjusted significance level - 0.017

Table 12 – Posthoc comparisons of MDAS scores by housing status – Games-Howell (n=317)

	Mean Bought home n=165	Mean Renting Privately n=46	<i>P</i> *
MDAS	10.8 (4.8)	15.6 (5.9)	0.000
	Mean Bought home n=165	Mean Social/Temp Housing n=106	<i>P</i> *
MDAS	10.8 (4.8)	14.6 (6.2)	0.000
	Mean Renting Privately n=46	Mean Social/Temp Housing n=106	<i>P</i> *
MDAS	15.6 (5.9)	14.6 (6.2)	0.638

*Adjusted significance level - 0.017

Regression analyses

Regression analyses were carried out to determine whether demographic variables could predict the PDCS or subscale scores. Demographics and the PDCS were included in a hierarchical regression to determine their predictive power in relation to dental anxiety. Demographic variables were recoded as binary or dummy variables to allow for their inclusion into the regression as independent variables. Reference categories for these variables were: full time parent; not married; not educated to university level; and living in a bought home. The PDCS was the dependent variable in the first regression, with its subscales dependent variables in subsequent regressions.

The regression equation for the first model was significant ($F(7, 262)=14.43, P<0.001$), with demographic variables predicting 28% of the variance in Parental Dental Concerns. Parents who were not working, who did not own their own home, and who had a greater number of children, were more likely to score high on the PDCS, indicating a number of parental concerns in relation to their children (Table 13).

Table 13 – OLS regression analysis - PDCS

	B	SE	β	t	P
Constant	51.10	4.10		12.45	0.000
Work	-3.66	1.31	-0.16	-2.79	0.006
Living Status	1.69	1.66	0.06	1.02	0.310
Education	-2.62	1.44	-0.11	-1.82	0.070
Housing - Rent	5.60	2.06	0.17	2.72	0.007
Housing - Other	6.82	1.87	0.28	3.67	0.000
Age	-0.14	0.12	-0.08	-1.13	0.262
No. Children	1.66	0.65	0.14	2.55	0.012
$R^2 = 0.28$					

The regression equation was also significant for Parental Exclusion, $F(7, 262)=11.82$, $P<0.001$, with demographic variables explaining 24% of the variance in the dependent variable. Variables were significant as for the PDCS, with parents working (either full or part time), living in a bought home, and with fewer children, more likely to have low Parental Exclusion scores (Table 14).

Table 14 – OLS regression analysis – Parental Exclusion

	B	SE	β	t	P
Constant	22.73	2.62		8.69	0.000
Work	-2.87	0.84	-0.20	3.44	0.001
Living Status	0.56	1.06	0.03	0.53	0.589
Education	-1.06	0.92	-0.07	-1.15	0.251
Housing - Rent	4.40	1.31	0.22	3.36	0.001
Housing - Other	4.11	1.19	0.27	3.45	0.001
Age	0.04	0.08	0.03	0.48	0.630
No. Children	1.20	0.42	0.17	2.89	0.004
$R^2 = 0.24$					

Demographic variables significantly predicted Bottlefeeding ($F(7, 262)=6.41, P<0.001$), but to a lesser extent than the previous dependent variables, explaining only 15% of its variance. Only two variables were significant in predicting Bottlefeeding, education and age. Parents educated to university level, and older mothers, were more likely to respond positively to breastfeeding (Table 15).

Table 15 – OLS regression analysis - Bottlefeeding

	B	SE	β	t	P
Constant	10.11	1.20		8.42	0.000
Work	0.02	0.38	0.00	0.05	0.960
Living Status	-0.18	0.49	-0.03	-0.37	0.709
Education	-1.68	0.42	-0.26	-4.00	0.000
Housing - Rent	0.36	0.60	0.04	0.60	0.550
Housing - Other	0.54	0.55	0.08	1.00	0.320
Age	-0.08	0.04	-0.15	-2.10	0.037
No. Children	0.00	0.19	0.00	-0.02	0.988

R² = 0.15

Demographic variables were not great predictors of the Going to the Dentist subscale ($R^2=0.08$). Whilst the model was significant ($F(2, 262)=3.3, P=0.002$), no demographic variables significantly predicted the subscale at the 5% level (Table 16).

Table 16 – OLS regression analysis – Going to the Dentist

	B	SE	β	t	P
Constant	11.43	1.32		8.65	0.000
Work	-0.19	0.42	-0.03	-0.44	0.659
Living Status	0.95	0.54	0.12	1.78	0.076
Education	0.36	0.46	0.05	0.78	0.435
Housing - Rent	0.36	0.66	0.04	0.54	0.591
Housing - Other	0.81	0.60	0.11	1.35	0.180
Age	-0.07	0.40	-0.13	-1.65	0.101
No. Children	0.31	0.21	0.09	1.47	0.143

R² = 0.08

The regression model represented in Table 17 significantly predicted Housing Dissatisfaction ($F(7, 262)=5.57, P<0.001$), explaining 13% of the variance in the dependent variable. The only significant variable was Housing Other, with parents living in social or temporary housing, or living with family and friends, more likely to score highly on the Housing Dissatisfaction scale than parents living in a bought home.

Table 17 – OLS regression analysis – Housing Dissatisfaction

	B	SE	β	t	P
Constant	6.83	1.15		5.96	0.000
Work	-0.62	0.37	-0.11	-1.69	0.093
Living Status	0.36	0.46	0.05	0.77	0.440
Education	-0.25	0.40	-0.04	-0.61	0.540
Housing - Rent	0.48	0.57	0.06	0.83	0.407
Housing - Other	1.37	0.52	0.22	2.63	0.009
Age	-0.04	0.04	-0.08	-1.04	0.300
No. Children	0.15	0.18	0.05	0.84	0.402
R ² = 0.13					

The final regression was a hierarchical regression with dental anxiety as the dependent variable (Table 18). During qualitative interviews, parents experiencing concerns also reported dental anxiety. In Model 1, demographic variables were added as independent variables. In Model 2, the PDCS was added as an independent variable in addition to demographic variables. Results indicate that only 3% additional explained variance was found as a result of adding the PDCS to Model 1, suggesting that demographic variables are mediated through the PDCS. The only demographic variable that significantly predicted dental anxiety was age, with older parents less likely to report anxiety.

Table 18 – OLS regression analysis – Dental anxiety

	B	SE	β	t	P
Model 1 - $F(7, 261)=9.37$, $P<0.000$, $R^2=0.20$					
Constant	10.62	2.76		3.85	0.000
Work	0.24	0.71	0.02	0.34	0.733
Living Status	0.77	0.89	0.06	0.87	3.880
Education	1.36	0.77	0.11	1.76	0.800
Housing - Rent	2.88	1.11	0.17	2.60	0.100
Housing - Other	2.09	1.02	0.16	2.05	0.420
Age	-0.20	0.07	-0.21	-3.07	0.002
No. Children	0.57	0.35	0.10	1.62	0.106
Model 2 - $F(8, 260)=9.89$, $P<0.000$, $R^2=0.23$					
PDCS	0.11	0.03	0.21	3.32	0.001

Study 2

Method

Research context

All participants were from areas of NHS Highland where the Childsmile Practice Programme had been introduced.

Sample and procedure

The same inclusion criteria was applied as in Study I, with the exception that parents must have signed up to Childsmile Practice, have provided contact details, and noted that they were willing to be contacted for the purposes of the Programme's evaluation. This information was obtained from the University of Dundee's Health Informatics Centre. An invitation letter, information sheet, and a copy of the questionnaire were sent by mail to all parents meeting these inclusion criteria from NHS Highland. Parents were asked to return the questionnaire using an enclosed Freepost envelope. Consent was presumed if parents returned completed questionnaires to the research team. The information sheet included contact information for the research team if parents wished to get in touch. Parents who had not returned a questionnaire after three weeks, were given a reminder telephone call about the study. Questionnaires were sent to 574 parents.

The questionnaire

Parents completed a modified version of the Client Satisfaction Questionnaire 8 (CSQ8) (Larsen *et al.*, 1979), in addition to the questions asked in Study I. The CSQ8 is an eight item inventory which assesses satisfaction with primary care services on a 4-point Likert Scale. Items include the quality of the service, satisfaction with the help received, and help to deal with problems more effectively.

Additional information on parents' adherence with Childsmile Practice was collected from children's dental records by the Information Services Division (ISD), NHS Scotland, including whether the child had attended a Childsmile Practice appointment, and whether they were registered with the General Dental Service.

Data analysis

SPSS Statistics version 19.0 was used for all analysis. Pearson correlations investigated associations between variables. One way analysis of variance tested group differences in terms of PDCS and MDAS score. CFA was carried out as described for Study 1. The PDCS's ability to discriminate between parents adhering and not adhering with Childsmile Practice and preventive dental care was determined using independent samples t-tests. Independent samples t-tests were also used to discriminate between parents who were regular dental attenders and those who attended less regularly.

Results

Descriptive analysis

One hundred and seventy parents from a possible 574 returned questionnaires, resulting in a response rate of 30%. Respondents and non-respondents were compared in relation to deprivation level, urban/rural location, and child's age to determine whether significant differences existed between the two groups. Deprivation levels were determined by linking postcode information to the Scottish Index of Multiple Deprivation. Chi-square tests suggested that there were significant differences in relation to deprivation level, $\chi^2=9.05$, $df=1$, $P=0.003$, but not urban/rural location, $\chi^2=2.73$, $df=1$, $P=0.099$. A significantly greater proportion of parents living in areas of low deprivation (the lowest three quintiles) responded to the survey, compared with parents living in areas of high deprivation (the highest two quintiles). Respondents and non-respondents did not differ significantly by their youngest child's age, $t(572)=1.82$, $P=0.069$.

Demographic information for Study 2 can be found in Table 19, including deprivation level and urban/rural classification. Parents' mean age was 30 years (SD = 7.0).

Table 19 – Demographic variables – Study 2 (n=170)

No. children	n	%	M (SD)	Living status	n	%	M (SD)
1	92	54.1	54.4 (7.0)	Married	90	52.9	53.0 (9.3)
2	52	30.6	54.3 (6.9)	Living with partner	53	31.2	55.3 (7.3)
3+	25	14.7	54.4 (9.0)	Single	26	15.3	55.6 (7.0)
Missing	1	0.6		Missing	1	0.6	
Working status	n	%	M (SD)	Education level	n	%	M (SD)
Full time parent	86	50.6	55.4 (7.2)	School/College	119	70.0	54.4 (8.8)
Working/Studying	84	49.4	53.5 (7.3)	University	51	30	53.5 (7.5)
Missing	0	0		Missing	0	0	
Housing type	n	%	M (SD)	Deprivation level	n	%	M (SD)
Bought home	98	57.6	53.6 (7.4)	SIMD 1& 2 - high	65	38.2	55.0 (10.0)
Other	72	42.4	55.4 (7.1)	SIMD 3,4, 5 - low	104	61.2	53.6 (7.3)
Missing	0	0		Missing	1	1.0	
Urban/Rural classification	n	%	M (SD)				
Urban areas	29	17.1	54.5 (10.8)				
Rural areas	140	82.4	53.5 (7.0)				
Missing	1	1.0					

Information on attendance and registration was available for 147 children. Of these children, 28% had not attended for a Childsmile appointment, and 27% were not registered with the General Dental Service.

Client Satisfaction Questionnaire

Participants answered questions on their experiences of Childsmile. Eight questions were adapted from the Client Satisfaction Questionnaire 8 (Larsen *et al.*, 1979). Principal Components Analysis indicated that a single component existed within the data, explaining 62.8% of the variance in the latent variable. The mean score of the combined scale was 23.5 (SD = 2.5), with possible scores ranging from 8 to 32. High scores indicated increased satisfaction. Descriptive results are shown in Table 20, and suggest that participants rated their experiences of Childsmile very highly.

Table 20 – Client Satisfaction Questionnaire – Childsmile Practice (% of responses) (n=170)

	Excellent	Good	Fair	Poor
How would you rate the quality of service you received from Childsmile?	52.1	37.3	7.1	3.6
	No, definitely not	No, not really	Yes, generally	Yes, definitely
Did you get the kind of service you wanted?	1.2	7.1	47.0	44.6
	Almost all of my needs have been met	Most of my needs have been met	Only a few of my needs have been met	None of my needs have been met
To what extent has Childsmile met your needs?	48.2	39.9	8.9	3.0
	No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely
If a friend were in your situation, would you recommend Childsmile to them?	1.2	3.0	34.3	61.5
	Quite dissatisfied	Indifferent or mildly Indifferent	Mostly satisfied	Very satisfied
How satisfied are you with the help you received from Childsmile to get dental treatment for your child?	3.0	10.1	33.9	53.0
	Yes, they helped a great deal	Yes, they helped somewhat	No, they really didn't help	No, they seemed to make things worse
Has Childsmile helped you to look after your child's teeth and gums?	46.2	46.2	7.1	0.6
	Very satisfied	Mostly satisfied	Indifferent or mildly indifferent	Quite dissatisfied
Overall, how satisfied are you with Childsmile?	63.3	27.8	5.9	3.0
	No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely
If you were to get help for your child's teeth, would you contact Childsmile?	2.4	9.5	44.4	43.8

Dental anxiety

The mean score for the MDAS was 12.8 (SD = 5.6) for this sample. Seventy eight per cent of parents had attended the dentist in the last six months, with 59% reporting that they attend at least every six months. Moderate or high dental anxiety (defined as a MDAS score of ≥ 19) was reported by 64% of parents with 18% highly dentally anxious. Forty per cent of parents reported that they were very or extremely anxious about having a tooth drilled, and 41% were similarly anxious about receiving a local anaesthetic injection. Fifteen per cent of parents reported feeling very or extremely anxious if they were awaiting treatment the following day, or in the waiting room, whilst 16% reported feeling very or extremely anxious about receiving a scale and polish.

Bivariate analysis

Pearson correlations were carried out on scaled data and a number of significant associations were found (Table 21). Moderate correlations were identified between the CSQ and Attitudes towards going to the dentist, as well as the PDCS and Bonding, and the MDAS and Attitudes towards going to the dentist. Significant, but weak, correlations were also found between the CSQ and PDCS, and the CSQ and Bonding. The MDAS was also weakly correlated with Bonding.

Table 21 – Pearson correlations (n=165)

	CSQ	PDCS	MDAS	ATT	Bond
CSQ	1				
PDCS	-0.159*	1			
MDAS	-0.054	0.275**	1		
ATT	0.357**	-0.266**	-0.135	1	
Bond	0.159*	-0.292**	-0.180*	0.265**	1

* Significant at the 5% level

** Significant at the 1% level

One way analysis of variance was carried out to determine whether group differences existed for demographic variables and the CSQ. Results from six ANOVA tests indicated that there were no significant difference between demographic groups for the CSQ (Working status $F(2,165)=2.54$, $P=0.082$; Living status $F(2,165)=2.20$, $P=0.114$; Education level $F(2,165)=1.11$, $P=0.331$; Housing type $F(2,165)=0.36$, $P=0.697$; Deprivation level $F(4,162)=0.12$, $P=0.337$; Location type $F(3,163)=0.64$, $P=0.588$).

Additional analysis of variance tests were carried out to investigate whether differences in scores existed for the PDCS and MDAS in relation to deprivation level, and independent t-tests in relation to urban/rural location. Results indicated that no significant differences existed for different deprivation levels (PDCS $F(4,162)=1.25$, $P=0.292$; MDAS $F(4,162)=1.53$, $P=0.196$) or urban/rural location (PDCS $t(164)=1.08$, $P=0.284$; MDAS $t(165)=0.321$, $P=0.749$).

Construct validity

To investigate further the adequacy of the measurement model fitted in Study 1, Confirmatory Factor Analysis was carried out on respondents who had fully completed each item of the PDCS ($n=165$). Results indicated that with no uncorrelated errors, the model was outside the range considered adequate for good model fit, with a χ^2/DF ratio= 1.69 as the single adequate goodness of fit measure ($\chi^2=312.52$, $df\ 185$, $P<0.001$, $RMSEA=0.070$, $CFI=0.845$). With the addition of five correlated errors, the adequacy of the model was confirmed from three of the four goodness of fit measures ($\chi^2=245.82$, $df\ 180$, $P=0.001$; $\chi^2/DF=1.366$; $CFI=0.920$; $RMSEA=0.047$, $90\% LCI=0.031$ $90\% HCI=0.061$).

Predictive validity

The ability of the PDCS and its subscales to discriminate between parents who engage in preventive care for their children and those who do not was assessed using independent samples t-tests, as was the ability of the PDCS and its subscales to discriminate between parents who attended the dentist for themselves at least once per year, and those attending

less than once per year. Results indicated that there was a significant difference for the Going to the Dentist subscale between parents who had attended a Childsmile Practice appointment with their child, and those who had not (Table 22). Parents attending Childsmile Practice appointments reported lower concerns. There was also a significant difference for the PDCS, and a tendency towards significance for the Going to the Dentist subscales, between parents of children registered and those not registered with the General Dental Service. In each case, parents of registered children reported lower concerns. Finally, there were significant differences between parents who attended the dentist at least once per year and those who did not for the Housing Dissatisfaction subscale, with parents attending the dentist at least once per year reporting lower concerns compared with parents who attended less regularly. There was also a tendency towards significance for the Bottlefeeding subscale, with parents attending the dentist regularly, less likely to report concerns.

Table 22 – Independent t-tests of child & parental dental attendance

	Childsmile Attendance		
	Mean (SD)	Mean (SD)	<i>P</i>
	No (n=41)	Yes (n=106)	
PDCS	55.6 (7.1)	53.8 (7.3)	0.166
Parental Exclusion	24.8 (5.8)	23.5 (6.1)	0.290
Bottlefeeding	7.9 (2.7)	7.9 (2.7)	0.948
Going to the Dentist	14.8 (1.6)	14.0 (1.8)	0.024
Housing Dissatisfaction	8.2 (1.3)	8.2 (1.5)	0.998
	Registration with GDS*		
	Mean (SD)	Mean (SD)	<i>P</i>
	No (n=39)	Yes (n=108)	
PDCS	56.4 (6.3)	53.5 (7.4)	0.036
Parental Exclusion	25.3 (5.7)	23.5 (5.7)	0.103
Bottlefeeding	7.9 (2.8)	7.9 (3.0)	0.964
Going to the Dentist	14.7 (1.7)	14.1 (1.8)	0.054
Housing Dissatisfaction	8.5 (1.4)	8.1 (1.4)	0.137
	Parental Attendance		
	Mean (SD)	Mean (SD)	<i>P</i>
	Regular (n=131)†	Irregular (n=34)	
PDCS	49.1 (8.9)	50.8 (9.3)	0.314
Parental Exclusion	25.3 (6.8)	24.6 (5.5)	0.561
Bottlefeeding	7.7 (3.0)	8.6 (2.8)	0.066
Going to the Dentist	10.5 (3.1)	10.9 (3.0)	0.532
Housing Dissatisfaction	5.6 (2.3)	6.7 (2.7)	0.022

*General Dental Service

† Regular = attendance at least once per year

Summary

The results from Study 1 indicate that the PDCS had good validity and reliability. Construct validity was determined from a Principal Components Analysis, and analysis of internal consistency, which suggested that there were four subscales within the PDCS.

Confirmatory Factor Analysis confirmed the adequacy of the four factor, second order model, with an overarching PDCS variable. Concurrent validity was also good, with significant correlations with the Modified Dental Anxiety Scale. Reliability of the PDCS was excellent over a two month period.

Additional analysis of the PDCS showed that scores differed by demographic group, with lower concerns reported by parents who were working, married, educated to university level or above, and who owned their own home. Regression analysis controlled for demographic variables, and suggested that higher concerns were predicted for parents who were not working, who did not own their home, and who had a greater number of children.

Similar analysis showed that higher dental anxiety was reported by parents who were living with a partner or single, and those who did not own their home. In a multiple regression analysis, the PDCS and age significantly predicted dental anxiety: those with higher parental concerns, and younger parents, reported higher anxiety.

In Study 2, questionnaires were sent to all parents signed up to the Childsmile Practice Programme from a single health board area. Response rates were relatively low, and are likely to reflect the difficulty in engaging hard to reach parents in both research and health programmes (Bergstrand *et al.*, 1983).

Parents were asked about their experiences of Childsmile Practice. Very few parents reported dissatisfaction. It is possible that parents who were happy with their care were more likely to respond to the questionnaire. There were no demographic differences in terms of satisfaction with Childsmile Practice.

Confirmatory Factor Analysis further demonstrated the adequacy of the PDCS measurement model. The predictive validity of the PDCS was also established. The PDCS and its subscales were able to discriminate between parents who did and did not engage in preventive dental visits for their children, and parents who attended and did not attend regularly for their own dental appointments. In all cases, parents attending and engaging reported lower concerns.

Discussion

Previous studies investigating predictors of parent's attendance and non-attendance at dental appointments for their children, have found that non-attendance is significantly associated with demographic, psychosocial, and system-related variables.

Demographic variables include having a low income (Kim, 2005), family's race (Milgrom *et al.*, 1998), the number of years parents have lived as an immigrant (*Ibid*), children being very young (Baldani *et al.*, 2011), living in family homes under absent ownership (*Ibid*), and high community level unemployment (Quinn *et al.*, 2009). Psychosocial factors include lack of belief in the value of dental care (Kim, 2005; Milgrom *et al.*, 1998), lack of social support (Nahouraii *et al.*, 2008), perceived need (Baldani *et al.*, 2011; Milgrom *et al.*, 1998), child dental anxiety (Milgrom *et al.*, 1998), absences from school (Milgrom *et al.*, 1998), poor oral hygiene habits (Baldani *et al.*, 2011), believing oral health to be less important than general health (Kelly *et al.*, 2005), and lack of knowledge (Hilton *et al.*, 2007). System-related variables include lack of provider insurance (Edelstein, 2000; Kim, 2005), long waiting times (Mofidi *et al.*, 2002; Siegal *et al.*, 2005), lack of transport (Broder *et al.*, 2002; Kelly *et al.*, 2005; Mofidi *et al.*, 2002), inconvenient appointment times (Kim, 2005), poor communication on the part of dental health professionals (Barker & Horton, 2008; Broder *et al.*, 2002; Mofidi *et al.*, 2002), and poor dental care during parents' own childhood (Hilton *et al.*, 2007).

More complex issues identified as barriers to attendance at child dental appointments are the stigma associated with being a public insurance recipient (Harper, 1994; Lam *et al.*, 1999; Spisak & Holt, 1999), the stress of family difficulties (Hallbert *et al.*, 2008), and poor mental health (Kavanaugh *et al.*, 2006; Kenney *et al.*, 2005). In a qualitative study, Swedish parents described being 'overloaded in everyday life', and spoke of the subsequent impact of this overload on attendance at preventive dental appointments (Hallberg *et al.*, 2008). Staff working with families who do not attend preventive appointments identified family dysfunction and daily hassles as major barriers to participation (Broder *et al.*, 2002). The children of parents with poor mental health are twice as likely to have unmet dental needs (Kavanaugh *et al.*, 2006; Kenney *et al.*, 2005), and are twice as likely to brush their teeth less than twice per day (Kenney *et al.*, 2005).

Positive predictors of dental attendance have been identified, such as strong social networks, including material and emotional support (Nahouraii *et al.*, 2008), attendance at school or nursery (Baldani *et al.*, 2011), extended clinic hours (Kim, 2005), and attendance for other medical visits (Milgrom *et al.*, 1998).

Parental Dental Concerns Scale

The results from the studies reaffirm the complexity that has previously been identified in relation to parental attendance at preventive dental appointments for their children. Subscales of the PDCS were correlated with each other, indicating that parental concerns are inter-related over a number of areas. Of particular note is that the Parental Exclusion and Housing Dissatisfaction subscales correlated with the Going to the Dentist subscale, in line with previous work that has identified housing (Baldani *et al.*, 2011), social support (Nahouraii *et al.*, 2008) and depressive symptoms (Kavanaugh *et al.*, 2006; Kenney *et al.*, 2005) as predictors of non-attendance. This is the first scale to be developed that addresses these issues.

Dental anxiety

In the UK, 49% of the population have been identified as suffering from either moderate or high dental anxiety (Nuttall *et al.*, 2011). In Study 1, around 60% of participants reported that they were moderately or highly dentally anxious, and 64% of participants in Study 2. Levels of anxiety for each question within the MDAS were higher than in the Adult Dental Health Survey 2009 for both studies (*ibid*). This can perhaps be explained by the majority of both samples being mothers: women and younger people have higher levels of dental anxiety than men (Hittner & Hemmo, 2009; Humphris *et al.*, 2009; Nuttall *et al.*, 2011). This is potentially problematic as increased anxiety is associated with a decreased likelihood of attending the dentist (Nuttall *et al.*, 2011). Preventive dental programmes tend to be aimed at mothers as primary caregivers to their children. It is likely, therefore, that it is not only

child fear that is a negative predictor of attendance (Milgrom *et al.*, 1998), but also parental fear (Hilton *et al.*, 2007).

Existing literature on the MDAS has focused on establishing the validity and reliability of the scale, particularly across languages and cultures (Coolidge *et al.*, 2008; Coolidge, *et al.*, 2010; Ilguy *et al.*, 2005; Yuan *et al.*, 2008). There has been less focus, however, on the relationship between the MDAS and other psychosocial variables. In Study I, the MDAS was moderately and significantly correlated with the PDCS, with the PDCS a significant predictor of dental anxiety, after controlling for demographic variables. Existing literature has demonstrated a positive relationship between the MDAS and life satisfaction, thought suppression and health locus of control (Hittner & Hemmo, 2009). Humphris and King (2011) found that an increased risk of high dental anxiety was likely when individuals had experienced traumatic dental events such as extreme helplessness during dental treatment, lack of understanding from the dentist, and extreme embarrassment during dental treatment. They also found that history of past sexual assault increased the risk of high dental anxiety. Using an alternative measure of dental anxiety, de Jongh *et al.* (2006) identified traumatic past experiences as predicting high dental anxiety.

The PDCS does not focus on as extreme difficulties, such as traumatic past events, as outlined in the literature, but instead measures everyday difficulties in the lives of parents with young children. These are concerns that make life more challenging for parents, such as feeling down, feeling unhappy in one's home, and feeling excluded from society. Previous studies have suggested that the difficulties experienced by excluded groups within society are associated with poorer oral health outcomes. Coles *et al.* (2011) and Collins & Freeman (2007) have identified a relationship between poor mental health and dental anxiety. There also appears to be a negative relationship between depression and oral health related quality of life (Coles *et al.*, 2011). The PDCS was a relatively good predictor of high dental anxiety, with parents reporting greater concerns, more likely to suffer from high dental anxiety. Future work should focus more closely on the potential difficulties faced by families,

particularly those living in deprived areas, and the subsequent effect that these difficulties have on their children's oral health outcomes.

Limitations

Recruitment was positive in Study 1, where a non-probability convenience sample was employed with parents keen to participate. Study 2 had a lower response rate, most likely due to the use of a postal administration method. Ethical restrictions on approaching families limited opportunities to contact parents by other means in this study. Evidence of response bias was, therefore, unsurprising, with parents living in areas of high deprivation less likely to return questionnaires.

Conclusion

This work has demonstrated that the Parental Dental Concerns Scale has good reliability and validity. Results suggested that greater parental concerns were more likely to be experienced by parents who did not own their home, who were not working, and who had larger families. A positive association was demonstrated between the PDCS and dental anxiety. This relationship must be investigated further. A greater understanding of the complexity involved in parents' failure to attend and comply with preventative oral health programmes can improve participation and ultimately improve the oral health of children across Scotland and beyond.

Next Steps

Introduction

In the second phase of the DAPER study, the objective was to assess the psychometric properties of a new questionnaire measuring parental concerns regarding registration and access for preventive dental care for their child.

In the third phase, the objective is to conduct a field trial of the Parental Dental Concerns Scale, and assess if additional Dental Health Support Worker (DHSW) assistance can enable parents to access preventive dental care for their child.

Method

Design

A Non-equivalent Groups Design will be employed, with the primary outcome variable being child dental registration, and the secondary outcome variables being reduction in parental dental concerns and increase in satisfaction with treatment received.

Comparisons will be made for child dental registration, parental dental concerns and satisfaction with treatment received between those parents reporting high parental concerns and receiving additional DHSW assistance, and those who receive the current diet of visits by the dental health support worker.

The dental health support workers will provide additional support for the 'concerned parent'. This support will include more frequent visits to address parental concerns and assistance when contacting and accessing dental practices. It is proposed that the concerned parent will be visited to ensure that they register their child for continuous dental care. Specific details of the additional support will be noted.

Sample

A non-probability convenience sample of all new parents and those previously non-compliant with Childsmile Practice. Parents without Childsmile Practice experience will be sampled together with those who have previously been non-compliant with the programme. Permission will be sought to obtain child dental registration status using the child's CHI number as an outcome measure of child dental registration and attendance.

Parents will be accessed via the lead health visitor and DHSWs. All participating parents will be provided with an information sheet and consent forms prior to participation.

Questionnaire assessment

At baseline all parents will be asked as part of the initial risk assessment to complete the PDCS. Parents reporting high concerns (Phase 2, Study 2) will be provided with additional support from the dental health support worker. Parents will be asked to complete the Dental Visit Satisfaction Scale (Corah *et al.*, 1984) and the Client Satisfaction Questionnaire 8 (CSQ8) to assess their previous satisfaction with dental attendance.

At follow-up, and after the first dental attendance visit, all participating parents will be asked to complete the PDCS and the Dental Visit Satisfaction Scale and the CSQ8. Child's CHI number will be accessed as an independent measure of dental registration and attendance.

Statistical analysis

The data will be coded and entered onto an SPSS data sheet. The data will be subjected to: frequency distributions, chi-squared analysis, t-tests and ANCOVA.

References and Acknowledgements

References

- Baldani MH, Emílio Mendes YP, Campos Lawder JA, Ingles de Lara AP, da Silva Rodrigues MMA and Ferreira Antunes JL (2011). Inequalities in dental services utilization among Brazilian low-income children: the role of individual determinants. *Journal of Public Health Dentistry*, 71: 46–53.
- Barker JC and Horton SB (2008). An ethnographic study of Latino preschool children's oral health in rural California: Intersections among family, community, provider and regulatory sectors. *BMC Oral Health*, 8:8, 10.1186/1472-6831-8-8.
- Bergstrand R, Vedin A, Wiehelmsson C and Wilhelmsen L (1983). Bias due to non-participation and heterogenous sub-groups in population surveys. *Journal of Chronic Diseases*, 36: 725–728.
- Broder HL, Russell S, Catapano P and Reisine S (2002). Perceived barriers and facilitators to dental treatment among female caregivers of children with and without HIV and their health care providers. *Pediatric Dentistry*, 24: 301-308.
- Coles E, Chan K, Collins J, Humphris GM, Richards D, Williams B and Freeman R (2011). Decayed and missing teeth and oral-health-related factors: Predicting depression in homeless people. *Journal of Psychosomatic Research*, 71: 108-12.
- Collins J and Freeman R (2007). Homeless in North and West Belfast: An oral health needs assessment. *British Dental Journal*, 202, doi:10.1038/bdj.2007.473.
- Coolidge T, Chambers MA, Garcia LJ, Heaton LJ, Coldwell SE (2008). Psychometric properties of Spanish-language adult dental fear measures. *BMC Oral Health*, 8: 15, doi:10.1186/1472-6831-8-15.
- Coolidge T, Hillstead MB, Farjo N, Weinstein P, Coldwell SE (2010). Additional psychometric data for the Spanish Modified Dental Anxiety Scale, and psychometric data for a Spanish version of the Revised Dental Beliefs Survey. *BMC Oral Health*, 10: 12, doi:10.1186/1472-6831-10-12.

Deas L, Kidd J and Brewster L (2010). Childsmile Practice Primary Care Dental Services Monitoring Report for the Period 2006-2008.

De Jongh A, Fransen J, Oosterink-Wubbe F, and Aartman I (2006). Psychological trauma exposure and trauma symptoms among individuals with high and low levels of dental anxiety. *European Journal of Oral Sciences*, 114: 286–292.

Edelstein BL (2000). Access to dental care for Head Start enrollees. *Journal of Public Health Dentistry*, 603: 221-229; discussion 230-2.

Frazier PJ, Jenny J, Bagramian RA, Robinson E, Proshek JM (1977). Provider expectations and consumer perceptions of the importance and value of dental care. *American Journal of Public Health*, 67: 37–43.

Hallberg U, Camling E, Zickert I, Robertson A and Berggren U (2008). Dental appointment no-shows: Why do some parents fail to take their children to the dentist? *International Journal of Paediatric Dentistry*, 18: 27-34.

Harper HJ (1994). The dental health care system and minority patients. *Journal of Dental Education*, 58: 313–315.

Hayton JC, Allen DG and Scarpello V (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods*, 7: 191-205.

Hilton IV, Stephen S, Barker JC, Weintraub JA (2007). Cultural factors and children's oral health care: A qualitative study of carers of young children. *Community Dentistry and Oral Epidemiology*, 35: 429-438.

Hittner J and Hemmo R (2009). Psychosocial predictors of dental anxiety. *Journal of Health Psychology*, 14: 53-59.

Hu L-T and Bentler P (1995). Evaluating model fit. In RH Hoyle (Ed.) *Structural Equation Modeling. Concepts, Issues, and Applications*. London: Sage, pp. 76-99.

Humphris G, Morrison T and Lindsay SJE (1995). The Modified Dental Anxiety Scale: UK norms and evidence for validity. *Community Dental Health*, 12: 143–150.

Humphris G, Dyer T and Robinson P (2009). The modified dental anxiety scale: UK general public population norms in 2008 with further psychometrics and effects of age. *BMC Oral Health*, 9: 20–28.

Humphris G and King K (2011). The prevalence of dental anxiety across previous distressing experiences. *Journal of Anxiety Disorders*, 25: 232-6.

İlgüy D, İlgüy M, Dinçer S and Bayirli G (2005). Reliability and validity of the Modified Dental Anxiety Scale in Turkish patients. *The Journal of International Medical Research*, 33: 352-259.

ISD Scotland (2011) Dental Statistics – NHS General Dental Service Registrations. A National Statistics Publication for Scotland.

Jhanjee I, Saxeena D, Arora J and Gjerdingen DK (2004). Parents' health and demographic characteristics noncompliance with Well-Child visits. *Journal of the American Board of Family Practice*, 17: 324-330.

Kavanaugh M, Halterman JS, Montes G, Epstein M, Hightower AD and Weitzman M (2006). Maternal depressive symptoms are adversely associated with prevention practices and parenting behaviors for preschool children. *Ambulatory Pediatrics*, 6: 32-37.

Kenney GM, McFeeters JR and Yee JY (2005). Preventive dental care and unmet dental needs among low-income children. *American Journal of Public Health*, 95: 1360-1366.

Kelly SE, Binkley CJ, Neace WP and Glae BS (2005). Barriers to care-seeking for children's oral health among low-income caregivers. *American Journal of Public Health*, 95: 1345-1351.

Kim, YOR (2005). Reducing disparities in dental care for low-income Hispanic children. *Journal of Health Care for the Poor and Underserved*, 16: 431-443.

Kline RB (1998). *Principles and practice of structural equation modelling*. New York: The Guilford Press.

Lam M, Riedy CA and Milgrom P (1999). Improving access for Medicaid-insured children: focus on front-office personnel. *Journal of the American Dental Association*, 130: 365–373.

Lannon C, Brack V, Stuart J, Caplow M, McNeill A, Bordley WC and Margolis P (1995). What mothers say about why poor children fall behind on immunizations: A summary of focus groups in North Carolina. *Archives of Pediatrics and Adolescent Medicine*, 149: 1070–1075.

Larsen DL, Attkisson CC, Hargreaves WA and Nguyen TD (1979). Assessment of client/patient satisfaction: Development of a general scale. *Evaluation and Program Planning*, 2: 197-207.

MacPherson LMD, Conway DI, Goold S, Jones CM, McCall DR, Merrett MCW and Pitts NB (2010). *National Dental Inspection Programme of Scotland. Report of the 2010 Survey of P1 Children*. Edinburgh: Scottish Dental Epidemiological Co-ordinating Committee.

Merrett MCW, Conway DI, Goold S, Jones CM, McCall DR, McMahon AD, Macpherson LMD and Pitts NB (2008). *National Dental Inspection Programme of Scotland: Report of the 2009 Survey of P7 Children*. Edinburgh. Scottish Dental Epidemiological Co-ordinating Committee.

Milgrom P, Mancl L, King B, Weinstein P, Wells N and Jeffcott E (1998). An explanatory model of the dental care utilization of low-income children. *Medical Care*, 36: 554-66.

Mofidi M, Rozier RG and King RS (2002). Problems with access to dental care for Medicaid-insured children: What caregivers think. *American Journal of Public Health*, 92: 53-58.

Nahouraii H, Wasserman M, Bender DE and Rozier RG (2008). Social Support and Dental Utilization among Children of Latina Immigrants. *Journal of Health Care for the Poor and Underserved*, 19: 428-441

Nuttall N, Freeman R, Beavan-Seymour C and Hill K (2011). Access and barriers to care - a report from the Adult Dental Health Survey. The Health and Social Care Information Centre www.ic.nhs.uk.

Quinn BC, Catalano RA and Felber E (2009). The effect of community-level unemployment on preventive oral health care utilization. *Health Services Research*, 44: 162-81.

Scottish Executive (2005). *An Action Plan for Improving Oral Health and Modernising NHS Dental Services in Scotland*. Edinburgh, Scottish Executive.

Siegal MD, Marx ML and Cole SL (2005). Parent or caregiver, staff, and dentist perspectives on access to dental care Issues for Head Start children in Ohio. *American Journal of Public Health*, 95: 1352-9.

Spisak S and Holt K (1999). Building partnerships to improve children's access to Medicaid oral health services: National Conference proceedings. Arlington, Va: National Center for Education in Maternal and Child Health.

Stevens J (2002). *Applied Multivariate Statistics*, 4th Edition. Mahwah, N.J.; London: Lawrence Erlbaum.

Streiner DL and Norman GR (2008). *Health measurement scales: A practical guide to their development and use*, 4th Edition. Oxford and New York: Oxford University Press.

Yuan S, Freeman R, Lahti S, Lloyd-Williams F and Humphris G (2008). Some psychometric properties of the Chinese version of the Modified Dental Anxiety Scale with cross validation. *Health and Quality of Life Outcomes*, 6: 22, doi:10.1186/1477-7525-6-22.

Acknowledgements

We would like to acknowledge the Childsmile Programme (award number: 121.804490) who funded this study.

This phase of the DAPER project would not have been possible without the cooperation of all the families that took part in the study. We are indebted to them for the time they spent communicating with us.

We are very grateful to Professor Gerry Humphris, University of St Andrew's, who provided statistical advice, and insightful comments on earlier drafts of this report.

We would also like to thank oral health promotion staff in NHS Highland who helped to distribute the questionnaire, and the Health Informatics Centre at the University of Dundee for their assistance in sending out questionnaires in Study 2, and liaising with staff at ISD. Staff working as part of the Dental Informatics Programme at ISD also provided information on children's dental attendance, and to them we also extend our thanks.

Appendices

Appendix 1:	Ethical Approval Documents
Appendix 2:	NHS Project Approval Documents
Appendix 3:	Parental Dental Concerns Scale
Appendix 4:	Descriptive Tables
Appendix5:	Financial Information

Appendix I – Ethical Approval Documents

- Parental information sheet
- Parental consent form
- REC approval letter



Developing an inventory to Assess Parental concerns and Enable child dental Registration

Participant Information Sheet

We invite you to participate in a research project. We believe it to be of potential importance. However, before you decide whether or not you wish to participate, we need to be sure that you understand firstly why we are doing it, and secondly what it would involve if you agreed. We are therefore providing you with the following information. Read it carefully and be sure to ask any questions you have, and, if you want, discuss it with outsiders. We will do our best to explain and to provide any further information you may ask for now or later. You do not have to make an immediate decision.

What is the purpose of this study?

This study is hoping to improve access to dentists for children. We are trying to find out more about the concerns of parents throughout Scotland, particularly in accessing dental health care, and the difficulties that young families face more generally. We know that other things like public transport, feeling down, or feeling frightened can stop people going to the dentist, and so we will ask you questions about these things too. We would like to ask you to help us with the study.

Why have I been chosen?

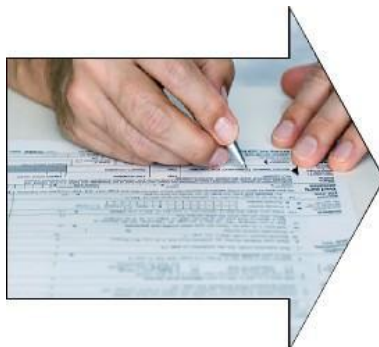
You are one of 400 parents throughout Scotland that we have asked to help us with this study.

Do I have to take part in this study?

No, taking part is completely up to you. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you or your family will receive.

What will happen to me if I take part?

If you agree to take part, we will ask you to:



Fill in a questionnaire about how you feel about going to the dentist, and your family life.

This should take around 10 minutes and can be done at a time and place best for you.



We will phone you 8 weeks later to arrange a good time to fill in a second questionnaire.

The second questionnaire lets us know whether our questions are reliable over a short time period.



Finally, we will ask you to fill in the second questionnaire.

Again this should take around 10 minutes to complete.

What about confidentiality?

All information given by you during the study will be kept strictly confidential, unless you indicate that your child is likely to be harmed in some way. Personal information, such as your name and address, will be kept separately from your questionnaire answers. Personal information will be kept for 6 months and then destroyed.

Questionnaire answers will be kept for 5 years and then destroyed. When the results are written up, no names will be used. No one will be able to link any information to you or your family. All information will be stored in a safe place that can only be accessed by the researchers working on this study.

Are there any risks for me if I decide to take part in this study?

There is unlikely to be any risk to you if you wish to take part in the study. However, if you feel uncomfortable answering any of the questions, then please move onto the next question. If any problems are raised, and you feel you need more support, then with your permission, we would be happy to contact your GP or health visitor to follow this up with you.

What will happen to the results of the research study?

The results of the study will be written up as part of a project report, and they will be published in professional academic journals. If you would like to receive a copy of the results from the study then please get in touch with the researchers on the numbers given below.

Who is organising and funding the research?

The project is organised by the University of Dundee with the help of local health boards. The Scottish Government is funding the project.

What if there is a problem?

If you believe that you have been harmed in any way by taking part in this study, you have the right to pursue a complaint and seek any resulting compensation through the University of Dundee who are acting as the research sponsor. Details about this are available from Stephanie Chambers (contact details listed below).

Who has reviewed this study?

The Fife & Forth Valley Research Ethics Committee, which has responsibility for scrutinising proposals for medical research on humans, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your records in this research be made available for scrutiny by monitors from NHS Tayside and the University of Dundee, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

Contact for further information

If during the course of the study you have any questions concerning the nature of the study, please contact Stephanie Chambers on 01382 420068 or 07794752740.

Or write to: Stephanie Chambers
 Research Fellow
 The Mackenzie Building
 The University of Dundee
 Kirsty Semple Way
 Dundee, DD2 4BF

Thank you for considering taking part in this study.



Version 1.4 17/05/2010

DAPER Project – Written Consent Form

Participant number:

- The researcher has explained to me what is involved in the study.
(PLEASE INITIAL THE BOX)
- I have read and understand the information sheet (version 1.4 17/05/2010)
(PLEASE INITIAL THE BOX)
- I agree to Childsmile staff/University researchers contacting me 8 weeks from now to carry out a second questionnaire.
(PLEASE INITIAL THE BOX)
- I understand that the data will be written up with all identifying information removed.
(PLEASE INITIAL THE BOX)
- I understand that if I reveal information suggesting that I may harm my child, the relevant authorities must be informed.
(PLEASE INITIAL THE BOX)
- I understand that I can withdraw from the study at any time and for any reason and that this will not affect the care that myself or my family receive from health staff.
(PLEASE INITIAL THE BOX)
- I have had the chance to ask questions about the study.
(PLEASE INITIAL THE BOX)
- I agree to take part in the study.

PLEASE SIGN YOUR NAME TO CONFIRM YOU ARE HAPPY TO TAKE PART IN THIS STUDY

Name of participant _____

Signature of participant _____ Date _____

(Please note that participants must date their own signature)

Name of researcher _____

Signature of researcher _____ Date _____





East of Scotland Research Ethics Service

Fife & Forth Valley Research Ethics Committee

Research Ethics Office
Residency Block, Level 2
Ninewells Hospital & Medical School
DUNDEE
DD1 9SY

Professor Ruth Freeman
Professor of Dental Public Health Research
University of Dundee
DHSRU, MacKenzie Building
Kirsty Semple Way
DUNDEE
DD2 4BF

Date: 17 March 2010
Your Ref:
Our Ref: FB/10/S0501/11
Enquiries to: Miss Fiona Bain
Extension: Ninewells extension 32701
Direct Line: 01382 632701
Email: fionabain@nhs.net

Dear Professor Freeman

Study Title: Developing an inventory to Assess Parental concerns and Enable child dental Registration.
REC reference number: 10/S0501/11
Protocol number: 1.1

Thank you for your letter of 22 February 2010, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by a sub-committee of the REC at a meeting held on 16 March 2010. A list of the sub-committee members is attached.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements.



Appendix 2 - NHS Project Approval Documents

- R&D approval letter
- Caldicott Guardian approval

Prof David J Godden, MD, FRCP(Edin), FRCP(Glasg)
Research Director
NHS Highland Research Office
Room S101
The Centre for Health Science
Old Perth Road
Inverness, IV2 3JH

Tel: 01463 255823
Fax: Not available
E-mail: david.godden@nhs.net



02 July 2010

NHS Highland R&D ID: 673
NRSPCC ID: NRS10/DN06

Professor Ruth Freeman
Consultant in Dental Public Health
MacKenzie Building
Kirsty Semple Way
Dundee
DD2 4BF

Dear Professor Freeman,

Management Approval for Non-Commercial Research

I am pleased to tell you that you now have Management Approval for the research project entitled: **'Developing an Inventory to Assess Parental Concerns and Enable Child Dental Registration: (DAPER Study)'**. I acknowledge that:

- The project is sponsored by the University of Dundee.
- The project is funded by Childsmile.
- Research Ethics approval for the project has been obtained from the Fife & Forth Valley Research Ethics Committee (East of Scotland Research Ethics Service), (Reference Number: 10/S0501/11).
- The project is Site-Specific Assessment exempt.

The following conditions apply:

- The responsibility for monitoring and auditing this project lies with the University of Dundee.
- This study will be subject to ongoing monitoring for Research Governance purposes and may be audited to ensure compliance with the Research Governance Framework for Health and Community Care in Scotland (2006, 2nd Edition), however prior written notice of audit will be given.

Working with you to make Highland the healthy place to be

Headquarters:
NHS Highland, Assynt House, Beechwood Park, Inverness, IV2 3HG

Chairman: Mr Garry Coutts
Chief Executive: Dr Roger Gibbins BA MBA PhD
Highland NHS Board is the common name of Highland Health Board



- All amendments (minor or substantial) to the protocol or to the REC application should be copied to the NHS Highland Research and Development Office together with a copy of the corresponding approval letter. All such amendments will be covered by the approval given by this letter, and it is therefore not necessary to seek amendment approval.
- The paperwork concerning all incidents, adverse events and serious adverse events, thought to be attributable to participant's involvement in this project should be copied to the NHS Highland R&D Office.

Please report the information detailed above, or any other changes in resources used, or staff involved in the project, to the NHS Highland Research and Development Manager, Frances Hines (01463 255822, frances.hines@nhs.net).

Yours sincerely,



Prof David J Godden
NHS Highland Research Director

cc Frances Hines, R&D Manager, NHS Highland Research & Development Office, Room S101, The Centre for Health Science, Old Perth Road, Inverness, IV2 3JH
 Pamela Shand, Senior Administrator, NHS Research Scotland Coordinating Centre, Research & Development Office, Foresterhill House Annexe, Foresterhill, Aberdeen, AB25 2ZB

**CALDICOTT APPROVAL FORM
FOR USE OF PATIENT IDENTIFIABLE DATA**

Please return this form to

Christine Robinson, Office Manager, Public Health, Assynt House, Beechwood Park,
Inverness IV2 3BW
Email: christine.robinson7@nhs.net

Project Title

Developing an inventory to Assess Parental concerns and Enable child dental registration (DAPER).

Name of Applicant: Professor Ruth Freeman

Address: DHSRU, Mackenzie Building, Kirsty Semple Way,
Dundee, DD2 4BF

Tel No 01382 420070

Email address: r.e.freeman@cpse.dundee.ac.uk

Name of organisation receiving data: University of Dundee

and their Data Protection Registration Number: Z6650266

What patient identifiable information are you looking to use?

CHI Number	<input checked="" type="checkbox"/>
Forename	<input checked="" type="checkbox"/>
Surname	<input checked="" type="checkbox"/>
Initials	<input type="checkbox"/>
Date of Birth	<input type="checkbox"/>
Address	<input checked="" type="checkbox"/>
Postcode	<input checked="" type="checkbox"/>
Other, please specify	<input type="checkbox"/>

Age	<input type="checkbox"/>
Gender	<input type="checkbox"/>

Application Number (for office use only)

1

Purpose for which data are to be used (principle 1)

The data will be used to contact parents who have signed up to the Childsmile Practice programme, and who have given consent to be contacted for the purposes of evaluation. Parents consenting to take part in the study will complete a 10 minute questionnaire on taking their child to the dental practice, everyday life with their child and their satisfaction with the Childsmile Practice programme. This information will help to predict the type of families who may need more support in accessing preventive dental care for their children.

Requirement to use identifiable data (principle 2)

The data is required as we have no other way of accurately finding out which families have signed up to Childsmile Practice.

Why is each data field required? (principle 3)

CHI Number – will help determine which parents have attended a Childsmile Practice appointment.
Forename/Surname – required for contacting parents.
Address/Postcode – required for contacting parents.

Outline access to information (principle 4)

National Data for the Childsmile program is currently received and stored on a secure server on the NHS network, within a secure room at the Health Informatics Centre (HIC) at the University of Dundee, as part of HIC's data management support for the Childsmile program. HIC will make the Highland data requested for this project available via a safe haven environment where the named researchers will not remove the data from the HIC server, but will access it remotely (via secure login) and view it via a secure virtual desktop. When the project is complete the data used will be archived within HIC.

Outline action taken to ensure compliance with responsibilities and obligations to respect patient confidentiality (principle 5)

All data users will read and sign the HIC Standard Operating Procedures (HIC SOP), see attached, which contains information about data protection and patient confidentiality and how data users are expected to comply. However as data will not be actually released to the researchers, it will be easier to ensure data is not being misused.

Application Number (for office use only)

2

Outline organisational compliance with legal requirements (principle 6)

HIC's highest priority is to address information governance, data security and confidentiality issues:

- Identifiable data are received by HIC in encrypted form and are stored, quality assured and processed securely in secure areas accessible only to staff with specific authorisation.
- All HIC processes are governed by the HIC Standard Operating Procedure (SOP) and are audited and inspected by an external auditor once a year. Prior to data being released, each approved researcher must read and sign the latest version of the HIC SOP.
- The Health Informatics Centre Confidentiality and Privacy Advisory Committee (HICCPAC), chaired by a Non-Exec member of the NHS Tayside Board, reviews the audit report and any adverse events, suggesting improvements to the SOP or any other actions needed to improve HIC processes and information governance.

What have you done to establish whether anyone else has the data you require?

HIC will be making a copy of the dataset available to ISD, to allow the measurement of HEAT targets, but HIC holds the original source copy of the dataset.

Please note: Copies of completed Approval Forms will be forwarded to NHS Highland's Area Information Security Manager and, if the project falls into non-research category, the Clinical Effectiveness Manager for comments.

Applicant: Professor Ruth Freeman

Job Title: Honorary Consultant in Dental Public Health (NHS Highland)

Signature: *Ruth Freeman* **Date:** 26 / 10 / 2020

Authorisation Granted Yes ☒ No ☐

Comments:

Caldicott Guardian: Dr Margaret Somerville, Director of Public Health, NHS Highland

Signature *M Somerville* **Date:** 4.11.20

Appendix 3 – Questionnaire

Parent and Child Dental Questionnaire

Participant number:



We would like to ask you some questions about how you find going to the dentist and life with your young children. This will help us find out how more support can be given to families to get to the dentist. There are no right or wrong answers – we are just interested in what you think. Most of the questions will ask you about your YOUNGEST child.

Part 1 – Going to the dentist

These questions are about your **youngest** child going to the dentist. Don't worry if you haven't taken them to the dentist yet; just answer about what you think it would be like.

For **each** of the questions below please **circle** the number between 1 and 7 that best shows what you think the visit would be like.

For me, going to the dentist for a check up for my youngest child would be:

Extremely negative						Extremely positive
1	2	3	4	5	6	7

For me, going to the dentist for a check up for my youngest child would be:

Extremely bad						Extremely good
1	2	3	4	5	6	7

For me, going to the dentist for a check up for my youngest child would be:

Extremely important						Not important at all
1	2	3	4	5	6	7

For me, going to the dentist for a check up for my youngest child would be:

Extremely difficult						Extremely easy
1	2	3	4	5	6	7

For me, going to the dentist for a check up for my youngest child would be:

Extremely helpful						Not helpful at all
1	2	3	4	5	6	7

For me, going to the dentist for a check up for my youngest child would be:

Extremely successful						Not successful at all
1	2	3	4	5	6	7

Please **circle** the number that shows whether you agree or disagree with each statement.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Dentists are family friendly.	1	2	3	4	5
Travelling to the dentist is easy.	1	2	3	4	5
I feel frightened about going to the dentist with my child/children.	1	2	3	4	5
Travelling to the dentist is expensive.	1	2	3	4	5
Other people in my situation find it easier to take their children to the dentist.	1	2	3	4	5

As a family who signed up to the Childsmile Practice Programme we would like to know what you think about it from your experience so far.

For each question please **circle** the number that shows how you feel about Childsmile.

	Excellent	Good	Fair	Poor
How would you rate the quality of service you received from Childsmile?	1	2	3	4

	No, definitely not	No, not really	Yes, generally	Yes, definitely
Did you get the kind of service you wanted?	1	2	3	4

	Almost all of my needs have been met	Most of my needs have been met	Only a few of my needs have been met	None of my needs have been met
To what extent has Childsmile met your needs?	1	2	3	4

Again, for each question please **circle** the number that shows how you feel about the Childsmile Programme.

	No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely
If a friend were in your situation, would you recommend Childsmile to them?	1	2	3	4

	Quite dissatisfied	Indifferent or mildly indifferent	Mostly satisfied	Very satisfied
How satisfied are you with the help you received from Childsmile to get dental treatment for your child?	1	2	3	4

	Yes, they helped a great deal	Yes, they helped somewhat	No they really didn't help	No, they seemed to make things worse
Has Childsmile helped you to look after your child's teeth and gums?	1	2	3	4

	Very satisfied	Mostly satisfied	Indifferent or mildly dissatisfied	Quite dissatisfied
Overall, how satisfied are you with Childsmile?	1	2	3	4

	No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely
If you were to get help for your child's teeth, would you contact Childsmile?	1	2	3	4

We would now like to know about how **you** feel about visiting the dentist. Please read each statement and **circle** the number that best shows your feelings.

	Not Anxious	Slightly Anxious	Fairly Anxious	Very Anxious	Extremely Anxious
If you went to your dentist for treatment tomorrow , how would you feel?	1	2	3	4	5
If you were sitting in the waiting room (waiting for treatment), how would you feel?	1	2	3	4	5
If you were about to have your teeth drilled , how would you feel?	1	2	3	4	5
If you were about to have your teeth scaled and polished , how would you feel?	1	2	3	4	5
If you were about to have a local anaesthetic injection in your gum, above an upper back tooth, how would you feel?	1	2	3	4	5

Please **circle** the number that best shows when you visit the dentist.

	In the last 6 months	Between 6 months and 1 year ago	Between 1 and 2 years ago	Between 2 and 3 years ago	More than 3 years ago	Have never been to the dentist
When did you last go to the dentist?	1	2	3	4	5	6

	Less than every 6 months	Around every 6 months	Once a year	Every 18 months – 2 years	Less than every 2 years	Only when I have a problem	Do not go to dentist
How often do you go to the dentist?	1	2	3	4	5	6	7

Part 2 – Family Life

In this section, we are asking about your family life. This helps us to find out what is easy for families, and what is more difficult.

*Please read each statement and **circle** the number that shows your feelings. Again, please answer thinking about your **youngest** child.*

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
My family help me by babysitting.	1	2	3	4	5
Breastfeeding is not for me.	1	2	3	4	5
I feel down most days.	1	2	3	4	5
I was happy with the care I received during my last pregnancy.	1	2	3	4	5
Since my child was born, I have not felt like my usual self.	1	2	3	4	5
I have someone close to me I can speak to about my problems.	1	2	3	4	5
Breastfeeding is difficult.	1	2	3	4	5

As before, please read each statement and **circle** the number that shows your level of agreement thinking about your **youngest** child.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
My child sleeps well at night.	1	2	3	4	5
I am happy where I am currently living.	1	2	3	4	5
Getting out the house with my child/children is difficult.	1	2	3	4	5
My current health visitor knows me well.	1	2	3	4	5
My child eats the foods I want them to eat.	1	2	3	4	5
Some days I feel miserable.	1	2	3	4	5
I get stressed if my child/children cry when we are out.	1	2	3	4	5
All my time is spent on being a parent.	1	2	3	4	5
My partner helps me look after our child/children.	1	2	3	4	5
People can be unfriendly when I am out with my child/children.	1	2	3	4	5
I was disappointed with the delivery of my last child.	1	2	3	4	5

Again, please read each statement and **circle** the number that shows your level of agreement for your **youngest** child.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Breastfeeding is better than bottle feeding.	1	2	3	4	5
I feel settled in my home.	1	2	3	4	5
I have little time to spend on myself.	1	2	3	4	5
My child drinks what I want them to drink.	1	2	3	4	5
My neighbours can be difficult.	1	2	3	4	5
I felt unprepared when I left hospital with my baby.	1	2	3	4	5
Some days I don't want to do anything.	1	2	3	4	5
My child is happy for me to care for their teeth and gums.	1	2	3	4	5
When I look in the mirror, I feel good about the person I see.	1	2	3	4	5

The next questions are quite sensitive. You do not have to answer all the questions, but it would be really helpful if you are happy to do so. We will not share your answers in any way that will identify you or your family.

Please **circle** how often you feel the following about your **youngest** child:

	Always	Very often	Quite often	Sometimes	Rarely	Never
I feel distant from my child.	1	2	3	4	5	6
Taking care of my child makes me feel nervous.	1	2	3	4	5	6
My child annoys me.	1	2	3	4	5	6

Part 3 – Some questions about you

If you don't mind, finally we'd like to ask a little more about you and your family. This helps us to find out the size and kind of families who might like more help in going to the dentist.

How many children currently live with you in your home?
(please write number in the box)

How old are these children? (please write the age of each child in the boxes below)

Age child 1:	Age child 6:
Age child 2:	Age child 7:
Age child 3:	Age child 8:
Age child 4:	Age child 9:
Age child 5:	Age child 10:

What age are you at the moment?

(please write number in the box)

Please **circle** the numbers that best describe your situation:

(circle all that apply)

	A full time parent	Working part time	Working full time	Studying part time	Studying full time
Are you?	1	2	3	4	5

	Married	Living with partner	In a relationship	Single	Divorced	Widowed
Are you?	1	2	3	4	5	6

	Primary school	Secondary school	College	University	Still studying (college)	Still studying (university)
What is your highest level of education?	1	2	3	4	5	6

	Living in bought home	Renting privately	Renting from council/housing association	Staying with family/friends	Living in temporary housing
What is your living situation at the moment?	1	2	3	4	5

Thank you for filling out our questionnaire.

Please now place the questionnaire in the envelope, seal the envelope and hand it to the researcher.

Appendix 4 – Descriptive Tables

- Study 1
- Study 2

Study I

For me going to the dentist with my youngest child would be:

	1	2	3	4	5	6	7		Missing
Extremely negative	2%	2.5%	3.5%	14%	11.3%	20.8%	44.9%	Extremely positive	4
Extremely helpful	51.9%	19.3%	7%	6%	7.5%	3.5%	2.5%	Not helpful at all	9
Extremely important	69.9%	14.5%	4.3%	2.3%	2%	3%	1.3%	Not important at all	11
Extremely difficult	3.5%	4.8%	9.1%	19.3%	16%	16.6%	27.3%	Extremely easy	14
Extremely bad	2.3%	1.3%	2.3%	12.5%	13%	18.6%	46.4%	Extremely good	15
Extremely successful	37.3%	19.8%	13.3%	13.3%	6.5%	3.5%	2.5%	Not successful at all	15

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree	Missing
Dentists are family friendly	3.8%	2%	18.3%	51.4%	23.8%	3
Travelling to the dentist is easy	2.3%	10.8%	15.3%	45.9%	25.3%	2
I feel frightened about going to the dentist with my child	46.6%	28.1%	12%	8.3%	4.5%	2
Travelling to the dentist is expensive	35.3%	34.8%	19.3%	7.5%	2.5%	2
Other people in my situation find it easier to take their children to their dentist	20.8%	23.1%	43.4%	10.3%	1.5%	4

	Not anxious	Slightly anxious	Fairly anxious	Very anxious	Extremely anxious	Missing
If you went to your dentist for treatment tomorrow, how would you feel?	35.6%	29.6%	15%	8%	11.3%	2
If you were sitting in the waiting room (waiting for treatment), how would you feel?	37.1%	28.1%	14%	9.3%	11%	2
If you were about to have your teeth drilled, how would you feel?	12%	27.6%	17.5%	17.5%	24.8%	2
If you were about to have your teeth scaled and polished, how would you feel?	52.4%	18.3%	11.5%	9.5%	7.5%	3
If you were about to have a local anaesthetic injection in your gum, above an upper back tooth, how would you feel?	13.5%	27.6%	18%	13.8%	26.1%	4

	In the last 6 months	Between 6 months and 1 year ago	Between 1 and 2 years ago	Between 2 and 3 years ago	More than 3 years ago	Have never been to the dentist	Missing
When did you last go to the dentist?	67.2%	17%	5.8%	3%	6.3%	0.8%	0

	Less than every 6 months	Around every 6 months	Once a year	Every 18 months – 2 years	Less than every 2 years	Only when I have a problem	Do not go to the dentist	Missing
How often do you go to the dentist?	6.3%	68.4%	8.3%	1.3%	0.8%	9.3%	5%	3

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree	Missing
My family help me by babysitting.	10.8%	12.3%	9.8%	36.6%	29.6%	4
Breastfeeding is not for me.	39.1%	11.8%	17.3%	15%	12.3%	18
I feel down most days.	42.6%	27.8%	17%	8%	3.8%	3
I was happy with the care I received during my last pregnancy.	3%	4.8%	7.5%	46.1%	33.1%	22
Since my child was born, I have not felt like my usual self.	28.8%	31.6%	20.8%	10.8%	5%	12
I have someone close to me I can speak to about my problems.	2.3%	4%	6%	46.6%	39.6%	6
Breastfeeding is difficult.	22.8%	13%	29.3%	18%	7.8%	36
My child sleeps well at night.	5.3%	10%	11.3%	38.6%	33.6%	5
I am happy where I am currently living.	7.5%	9%	9.3%	33.1%	40.1%	4
Getting out the house with my child is difficult.	36.3%	31.1%	20.3%	9.3%	2%	4
My health visitor knows me well.	12.5%	13.3%	24.3%	31.6%	16%	9
My child eats the foods I want them to eat.	5%	10.3%	16.8%	43.4%	22.6%	8
Some days I feel miserable.	19%	29.3%	22.3%	23.8%	4.5%	4
I get stressed if my child/children cry when we are out.	14.3%	31.6%	26.3%	22.1%	4.3%	6

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree	Missing
All my time is spent on being a parent.	4%	25.8%	16.8%	32.6%	19.8%	4
My partner helps me look after our child.	9.3%	3.8%	8.3%	36.8%	37.8%	16
People can be unfriendly when I am out with my child.	20.8%	38.8%	22.3%	14.3%	1.8%	8
I was disappointed with the delivery of my last child.	36.8%	30.8%	11.5%	8.5%	6.3%	24
Breastfeeding is better than bottlefeeding.	5.8%	6.8%	35.8%	16.5%	29.3%	23
I feel settled in my home.	4.3%	6.5%	9.8%	39.6%	37.6%	9
I have little time to spend on myself.	2.3%	22.3%	25.6%	34.1%	13.3%	10
My child drinks what I want them to drink.	2.3%	9%	11.8%	49.9%	24.3%	11
My neighbours can be difficult.	38.6%	29.8%	14.3%	9.5%	5.8%	8
I felt unprepared when I left hospital with my baby.	32.6%	39.8%	13%	6.3%	2.5%	23
Some days I don't want to do anything.	19.3%	28.3%	19%	24.6%	6.3%	10
My child is happy for me to care for their teeth and gums.	2.3%	6%	16.8%	45.9%	26.3%	11
When I look in the mirror, I feel good about the person I see.	6%	13.5%	33.6%	37.5%	7.3%	8

	Always	Very often	Quite often	Sometimes	Rarely	Never	Missing
I feel distant from my child.	0.3%	0.5%	1%	5.8%	19%	70.9%	10
Taking care of my child makes me nervous.	0.3%	0.5%	0.5%	5.8%	14.8%	75.7%	10
My child annoys me.	0.5%	2.5%	1.8%	22.1%	25.1%	45.4%	11

Study 2

For me going to the dentist with my youngest child would be:

	1	2	3	4	5	6	7		Missing
Extremely negative	0%	0%	1.8%	11.4%	10.8%	19.8%	56.3%	Extremely positive	3
Extremely helpful	57.5%	19.2%	9.6%	9.0%	3.0%	1.2%	0.6%	Not helpful at all	3
Extremely important	77.8%	12.0%	3.0%	2.4%	3.0%	0.6%	1.2%	Not important at all	3
Extremely difficult	1.8%	3.0%	8.9%	18.5%	20.8%	25.6%	21.4%	Extremely easy	3
Extremely bad	0%	0%	1.2%	5.4%	16.8%	29.3%	47.3%	Extremely good	3
Extremely successful	34.1%	26.9%	15.6%	10.8%	10.2%	2.4%	0%	Not successful at all	3

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree	Missing
Dentists are family friendly	1.2%	2.4%	14.1%	50%	32.4%	0
Travelling to the dentist is easy	3.5%	11.8%	14.1%	46.5%	24.1%	0
I feel frightened about going to the dentist with my child	51.2%	31.8%	11.2%	5.3%	0.6%	0
Travelling to the dentist is expensive	30.6%	32.4%	23.5%	12.4%	1.2%	0
Other people in my situation find it easier to take their children to their dentist	19.4%	20.6%	51.8%	5.3%	2.9%	0

	Not anxious	Slightly anxious	Fairly anxious	Very anxious	Extremely anxious	Missing
If you went to your dentist for treatment tomorrow, how would you feel?	35.3%	34.1%	15.9%	9.4%	5.3%	0
If you were sitting in the waiting room (waiting for treatment), how would you feel?	30.6%	38.8%	15.9%	8.2%	6.5%	0
If you were about to have your teeth drilled, how would you feel?	14.1%	29.4%	16.5%	15.9%	24.1%	0
If you were about to have your teeth scaled and polished, how would you feel?	41.2%	28.2%	14.7%	5.3%	10.6%	0
If you were about to have a local anaesthetic injection in your gum, above an upper back tooth, how would you feel?	13.5%	24.1%	21.2%	12.9%	28.2%	0

	In the last 6 months	Between 6 months and 1 year ago	Between 1 and 2 years ago	Between 2 and 3 years ago	More than 3 years ago	Have never been to the dentist	Missing
When did you last go to the dentist?	57.6%	23.5%	7.1%	2.9%	7.6%	0.6%	1

	Less than every 6 months	Around every 6 months	Once a year	Every 18 months – 2 years	Less than every 2 years	Only when I have a problem	Do not go to the dentist	Missing
How often do you go to the dentist?	4.7%	53.5%	21.8%	5.3%	2.4%	8.8%	3.5%	0

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree	Missing
My family help me by babysitting.	11.8%	11.2%	10.7%	38.5%	27.8%	1
Breastfeeding is not for me.	32.4%	18.8%	20%	20.6%	8.2%	0
I feel down most days.	48.2%	31.8%	13.5%	4.1%	2.4%	0
I was happy with the care I received during my last pregnancy.	4.1%	7.1%	6.5%	43.5%	38.8%	0
Since my child was born, I have not felt like my usual self.	44.1%	30%	13.5%	10%	2.4%	0
I have someone close to me I can speak to about my problems.	4.1%	3.5%	10.6%	37.6%	44.1%	0
Breastfeeding is difficult.	19.4%	12.4%	36.5%	19.4%	12.4%	0
My child sleeps well at night.	5.3%	14.1%	7.1%	27.1%	46.5%	0
I am happy where I am currently living.	4.1%	12.4%	14.1%	31.8%	37.6%	0
Getting out the house with my child is difficult.	32.9%	37.1%	14.7%	10.6%	4.7%	0
My health visitor knows me well.	10.6%	20%	25.3%	30.6%	13.5%	0
My child eats the foods I want them to eat.	1.8%	8.2%	13.5%	47.1%	29.4%	0
Some days I feel miserable.	20.6%	37.1%	14.7%	20%	7.6%	0
I get stressed if my child/children cry when we are out.	11.8%	39.4%	27.6%	17.6%	13.5%	0

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree	Missing
All my time is spent on being a parent.	4.1%	25.9%	15.9%	31.2%	22.9%	0
My partner helps me look after our child.	8.9%	6.5%	12.4%	31.4%	40.8%	1
People can be unfriendly when I am out with my child.	32.9%	41.8%	15.3%	9.4%	0.6%	0
I was disappointed with the delivery of my last child.	47.3%	29%	9.5%	7.1%	7.1%	0
Breastfeeding is better than bottlefeeding.	5.9%	12.4%	31.2%	20%	30.6%	0
I feel settled in my home.	0.6%	6.5%	9.4%	42.9%	40.6%	0
I have little time to spend on myself.	15.4%	49.1%	17.8%	15.4%	2.4%	0
My child drinks what I want them to drink.	0.6%	5.9%	7.1%	48.8%	37.6%	0
My neighbours can be difficult.	44.7%	34.1%	11.8%	7.1%	2.4%	0
I felt unprepared when I left hospital with my baby.	38.8%	40.6%	8.8%	9.4%	2.4%	0
Some days I don't want to do anything.	23.1%	32%	21.9%	16.6%	6.5%	0
My child is happy for me to care for their teeth and gums.	2.4%	4.7%	12.9%	53.5%	26.5%	1
When I look in the mirror, I feel good about the person I see.	4.7%	10.7%	32.5%	42%	10.1%	1

	Always	Very often	Quite often	Sometimes	Rarely	Never	Missing
I feel distant from my child.	0%	0%	1.2%	5.3%	11.2%	82.4%	0
Taking care of my child makes me nervous.	0%	0.6%	0%	4.7%	17.1%	77.6%	0
My child annoys me.	0.6%	0.6%	1.8%	20.6%	24.1%	52.4%	0

Appendix 5 – Financial Information

Childsmile Dental Public Health Unit Glasgow Dental Hospital & School 378 Sauchiehall Street Glasgow, G2 3JZ		EXPENDITURE 1/11/08 – 19/08/11	
Staff		118,090.58	
Indirect costs		130,626.60	
Consumables		3005.24	
Travel		1501.95	
Other Expenditure		74.24	
Equipment		576.52	
Estates Overhead		31,737.75	
PI Time Overhead		0.00	
Total		147,744.76	
Expenditure to date: 19/08/2011			

Payments received to date	£245,009.00
---------------------------	-------------



Address for correspondence:

Dental Health Services & Research Unit
Mackenzie Building
Kirsty Semple Way
Dundee, DD2 4BF
Email: s.a.chambers@dundee.ac.uk